TurboChef®
INCORPORATED

Service Manual
for
Model D Ovens

Models Covered in this Manual:

D1	Domestic		
D1A	Domestic	D1-EC	European
D1B	Domestic	D1B-EC	European
D2	Domestic	D2-EC	European
D2B	Domestic	D2B-EC	European

Please See Inside for Important Steps before Operating Oven.

Customer Service Toll Free Number (800) 908-8726

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IMPORTANT SAFETY INSTRUCTIONS

WHEN USING ELECTRICAL APPLIANCES, BASIC SAFETY PRECAUTIONS SHOULD BE FOLLOWED, INCLUDING THE FOLLOWING:

WARNING - To reduce the risk of burns, electric shock, fire, injury to persons or exposure to excessive microwave energy:

1. Read all instructions before using the appliance.
2. Read and follow the specific **"PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY"** found on page 5.
3. This appliance must be grounded. Connect only to properly grounded outlet. See **"GROUNDING INSTRUCTIONS"** found on page 6.
4. Install or locate this appliance only in accordance with the provided installation instructions.
5. Some products such as whole eggs and sealed containers - for example, closed glass jars - may explode and **SHOULD NOT** be heated in this oven.
6. Use this appliance only for its intended use as described in the owner's manual. **DO NOT** use corrosive chemicals or vapors in this appliance. This type of oven is specifically designed to heat, cook, or dry food. It is **NOT** designed for industrial or laboratory use.
7. Children **SHOULD NOT** use this appliance.
8. **DO NOT** operate this appliance if it has a damaged cord or plug, if it is not working properly, or if it has been damaged or dropped. See **"POWER SUPPLY CORD REPLACEMENT"** found on page 6.
9. This appliance should be serviced only by qualified service personnel
10. **DO NOT** cover or block any openings on the appliance.
11. **DO NOT** store this appliance outdoors. **DO NOT** use this product near water - for example, near a kitchen sink, in a wet basement, or near a swimming pool, and the like.
12. **DO NOT** immerse cord or plug in water.
13. Keep cord away; from heated surfaces.
14. **DO NOT** let cord hang over edge of table or counter.
15. **DO NOT** use a water jet for cleaning.
16. See "**Basic Maintenance Procedures - Care and Cleaning**" provided in this manual.
17. To reduce the risk of fire in the oven cavity:
    a) **DO NOT** overcook food. Carefully attend appliance if paper, plastic, or other combustible materials are placed inside the oven to facilitate cooking.
    b) Remove wire twist-ties from paper or plastic bag in oven.
    c) If materials inside the oven should ignite, keep oven door closed, turn oven off, and disconnect the power cord, or shut off power at the fuse or circuit breaker panel.
    d) **DO NOT** use the cavity for storage purposes. **DO NOT** leave paper products, cooking utensils, or food in the cavity when not in use.

SAVE THESE INSTRUCTIONS

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

1. **DO NOT** attempt to operate this oven with the door open since open-door operation can result in harmful exposure to microwave energy. It is important not to defeat or tamper with the safety interlocks.
2. **DO NOT** place any object between the oven front face and the door or allow soil or cleaner residue to accumulate on the sealing surfaces.
3. Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   a) Interlock operation.
   b) Proper door closing.
   c) Door (bent).
   d) Hinges and latches (broken or loosened).
   e) Door seals and sealing surfaces (arcing, wear, and other damage).
   f) Evidence of dropping or abuse.
4. Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide, or transmission line, and cavity for proper alignment, integrity, and connection.
5. Any defective or mis-aligned components in the interlock, monitor, door seal, and microwave generation and transmission systems must be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
6. The oven **SHOULD NOT** be adjusted or repaired by anyone except properly qualified service personnel.
7. A microwave leakage check to verify compliance with the Federal Performance Standard **MUST BE** performed on each oven prior to release to the owner.

SAVE THESE INSTRUCTIONS

RF INTERFERENCE CONSIDERATIONS

This oven generates radio frequency signals. This device has been tested and determined to be in compliance with applicable part of FCC part 18 requirements and to the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility at the time of manufacture. However, some other equipment may exhibit sensitivity to signals below these limits resulting in interference with that equipment.

If your equipment experiences interference, the following steps should be considered:

1. Increase the physical separation between this oven and the sensitive equipment.
2. If the sensitive device can be grounded, do so following accepted grounding practices.
3. If battery powered microphones are being affected, insure that the batteries are fully charged.
4. Keep sensitive equipment on electrically separate circuits, if possible.
5. **DO NOT** route intercom wires, microphone wires, or speaker cables near oven.

GROUNDING INSTRUCTIONS

This appliance **MUST BE** grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This appliance is equipped with a cord having a grounding wire with a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded.

WARNING - Improper use of the grounding can result in a risk of electric shock.

Consult a qualified electrician or serviceman if the grounding instructions are not completely understood, or if doubt exists as to whether the appliance is properly grounded.

DO NOT use an extension cord. If the power supply cord is too short, have a qualified electrician or serviceman install an outlet near the appliance.

POWER SUPPLY CORD REPLACEMENT

If the power supply cord is damaged, it **MUST BE** replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.

SAVE THESE INSTRUCTIONS

1.0 INSTALLATION

1.1 Model Identification and Rating

MODEL NUMBER AND NAMEPLATE INFORMATION is located on the nameplate label on the rear cover of the oven.

NOTE: An electrical schematic is supplied with the oven. It is located in the back of the Display Panel in an envelope. An electrical schematic is also provided in the Owner's Manual for the oven. Please <u>return</u> the schematic to the storage envelope for future use.

SERIAL NUMBER IDENTIFICATION is located on a serial number label attached underneath the lower right corner of the oven frame.

The following provides an identification of serial numbers assigned by TurboChef to specific currently manufactured oven types, and a brief description of the ovens.

D-1 Oven (Domestic) **Serial Numbers 10001 through 10055**.
First of this series was produced in April 1994. Cook Chamber, Frame, Door and outer covers made of stainless steel.

D1-A Oven (Domestic) **Serial Numbers 10056 through 10092**.
Same basic oven as the D-1. Door was changed from stainless steel to nickel-plated aluminum, to lighten it for easier operation and removal. The machined door flange on the previous model became a formed part.

D2-EC Oven (European) **Serial Numbers 10141 through 10210**.
Extension of D1-A. The height of the cook chamber increased from 4" to 5.25" to allow cooking of a greater variety of foods. Heater element terminals extend through the top cover of the heat exchanger rather than the left side, for easier assembly. A secondary audio alarm has been added to improve volume at cook cycle completion. A D-Sub 9 pin connector is brought to the rear of the oven for computerized downloading of recipes. Power wiring is WYE connected, 50 Hz.

D2B Oven (Domestic) **Serial Numbers 10101 through 10120, 100101 → , , 300101 → , 400101 → .**
This domestic version has the height of the cook chamber increased from 4" to 5.25" to allow cooking of a greater variety of foods. The electrical control box moved from the front of the oven to the right side. Heater element terminals extend through the top cover of the heat exchanger rather than the left side, for easier assembly. A secondary audio alarm has been added to improve volume at cook cycle completion. A D-Sub 9 pin connector is brought to the rear of the oven for computerized downloading of recipes. (Same as D2B-EC except power wiring is delta connected, 60 Hz.)

D2B-EC Oven (European) **Serial Numbers 10211 through 10220, 10221(First CE Qualified) through 10446, 110101 → , 310101 → , 410101 → .**
Same as the D2B Oven, except power wiring is WYE connected, 50 Hz.

1.2 INSTALLATION INSTRUCTIONS

1.2.1 Contractor Requirements

TurboChef ovens must be installed by a qualified food service equipment contractor, dealer or service agency. The installation must be made in conjunction with an understanding of applicable CE, UL, NSF, and FDA requirements and appropriate local codes.

Before starting installation, the owner/installer should understand and agree upon:

a) The installation policies of TurboChef Inc.
b) The installation plan based on overview and preparation.
c) The responsibility for testing, instruction of proper operation, use & care, and preventative maintenance.

WARNING

a) DEATH, INJURY, AND EQUIPMENT DAMAGE could result from improper installation of the TurboChef oven or installation of a unit which has been damaged during shipment or storage. Either of these conditions could void the equipment warranty.
b) DO NOT INSTALL a TurboChef oven suspected of damage.
c) INSTALL the TurboChef oven according to the policies and procedures outlined in this manual.

1.2.2 Installation Precautions

TurboChef Inc. designs and manufactures equipment to comply with applicable CE, UL, FDA, and FCC requirements. All equipment is designed and certified for safe operation when installed in accordance with local and or national codes. Many local codes exist, and it is the responsibility of the owner and installer to comply with these codes.

In no event shall the manufacturer assume any liability for damages or injury resulting from installations which are not in compliance with the instructions and codes listed above. The manufacturer shall not assume liability for damage or injury resulting from improper installation of equipment including temporary or unstable work stations or counter tops.

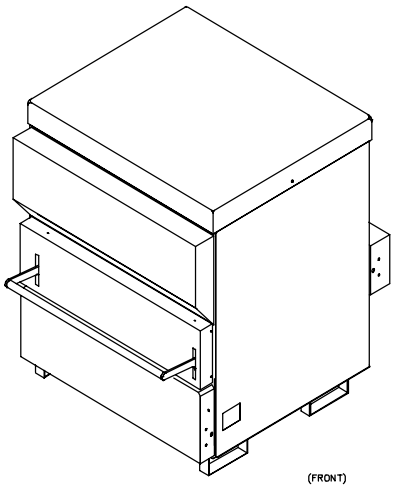
The counter top or work surface must be able to support the weight of 650 pounds and should not exceed 30 inches in height.

The oven should be installed level front to back and side to side. The oven legs may be bolted to the counter top if desired and must be bolted if it is placed on a rolling cart.

1.3 Specifications

1.3.1 Physical characteristics:

	D1 Models	D2 Models
Width:	31.5”	31.5”
Height:	39.0”	41.3”
Depth:	35.5”	35.5”
Weight:	534 lb.	540 lb.



1.3.2 Electrical Characteristics:

Characteristic	Domestic Models	EC Models
Voltage:	208-240 Volts AC, 60 Hz	400-415 Volts AC, 50 Hz
Phases:	Three Phase, 3~	Three Phase Wye, 3N~
Connections:	4 wire (incl. ground)	5-wire (incl. ground)
Current:	33-35 Amp	18 Amp
Power Usage (Maximums):		
Convection Oven:	9 Kw	9 Kw
Microwave Oven:	4 Kw	4 Kw
Microwave Frequency:	2450 MHz	2450 MHz
Connector Type:	NEMA 15-50	IEC 309 - 32 Amp

The unit is supplied with a 4’ power cord that includes a male connector. The outlet box, receptacle and wall plate are to be furnished by the installing contractor.

2.0 OPERATING INSTRUCTIONS

2.1 Glossary of Common Terms

Air - Percent of convection air flow during a cook event.

Constant Parameter - The constant parameter, Cook Temperature Set Point, is used by all Cook Settings.

Cook Chamber - Cavity in which the food products are cooked.

Cook Cycle - Time of operation for a Cook Setting.

Cook Setting - Recipe. The food product cooking process. It consists of duration, percentage of the hot air flow (AIR) required and microwave (TW) required.

Cook Mode - Execute the Cook setting instructions for selected food product.

Cooking Product - The food product to be cooked in the oven.

Cook Event – Segment of a cook cycle, up to four events can be used for each cycle.

COOL-DOWN Mode - Turns OFF all oven components except the cooling fan.

CURE Mode - Used to cure RTV sealant on waveguide plug.

Display - Primary interface to relay messages to the operator.

Duration - Time, in seconds, of a single cook event.

EDIT Mode - Mode used to adjust the Cook Setting parameters.

Keypad - Primary interface for the operator to control the oven.

HEAT - Selects the cook temperature set point in EDIT mode.

LED - Individual light indicators numbered 1 through 16 to show component status.

MAINTenance Mode - Mode used by authorized service personnel to check the operation of oven components.

Mode - The software environment which allows certain operations to occur. There are several modes, NORMAL, COOK, DIAGNOSTIC, EDIT and MAINTenance, in which the oven can operate.

NORMAL Operation Mode - Mode used to perform the "NORMAL" oven operations, such as, monitor the key pad for requests to cook or change mode, and maintain the oven at the Cook Temperature Set Point.

Parameter - A Cook Setting consists of two different kinds of parameters. Those which stay constant during a Cook Setting execution and those which can vary during different events of a Cook Setting.

Radio Frequency (RF) - The term used to describe the microwave emissions.

Recipe - Cook Setting. The food product cooking plan. It will consist of up to four Cook Events, each of which consists of duration, percentage usage of the hot air flow (AIR) required and microwave (TW) required.

RESUME - Continues Cook Cycle if interrupted such as by opening oven door.

TW - Percent of Microwave used during a Cook Event.

WARM-UP Mode - Mode that brings the oven up to the Cook Temperature Set Point.

2.2 Basic Operating Instructions for Model D Ovens.(Version R software)

Power On

The power switch is on the lower right side, towards the front when you are facing the oven. Pull the power switch toward the top of the machine to turn on.

Self Test/Warm Up

1. The machine will go through a self-check to verify that the critical components (magnetrons, heat exchanger and blower) are operational. (If the oven displays the message “Cooling Down”, Depress the “Warm Up” key to start.)

CAUTION: Self Test results are unpredictable if the oven door or filter door are not closed prior to or opened during the self test.

2. If any of the critical components are malfunctioning, the machine will stop at the end of the component test displaying a message identifying the faulty component. Refer to Troubleshooting Section for message definition.
3. When the self-check is complete and satisfactory, the machine will start warming up and display "WARMING UP, HX Temp …". The HX Temp is the temperature of the heat exchanger. When the HX temperature exceeds a value determined by the cook temperature set point, the blower begins circulating air and the display indicates “CC Temp/HX Temp” on the lower line. The CC Temp is the temperature in the oven cook chamber. When the CC temperature reaches the cook temperature set point, warm-up is complete. The Warm Up should take approximately 30 minutes (shorter if the machine has not cooled down completely).
4. When the oven is ready to cook, it will display:

Select Recipe CC 480° HX 571°	Or If in Diagnostic Mode	Select Recipe Heat 480/571°

Running A Recipe/Cook Setting

CAUTION: DO NOT operate the oven without food or a suitable microwave load in the cook chamber. This may damage the oven.

CAUTION: DO NOT operate oven with metal in the cook chamber. This will damage the oven.

1. Open cooking chamber door by pulling the handle up, then pull the handle outward until the door opens.
2. Place the food product in the appropriate position on the cooking platter.
3. Close cooking chamber door by pushing forward on the handle until the door shuts, then push the handle down to latch into place.
4. Press the desired food (group) Cook Setting button.

5. Press a button numbered 1 to 6 (subgroup) for food quantity or special food definition. The display indicates the food group/subgroup name and cook time seconds (counting down).
6. When the cooking cycle is complete, the oven will beep and the display will indicate "PLEASE REMOVE FOOD FROM OVEN". Remove the food product from the oven. Note: Food will continue to cook with radiant and convection energy when left in the oven due to the high cook chamber temperature.
7. The cook cycle is now ready to begin again.

Notes:

- If for any reason you want to stop the cooking cycle, press the “STOP” button at any time. The user may close the door and press "RESUME" for the Cook Setting to continue.
- If the oven door or filter door is opened during a cook cycle, the oven will automatically stop the current Cook Setting. The user may close the door and press “RESUME” for the Cook Setting to continue.
- If the “DARKER” key is depressed, 25% of the last cooking event is added as additional cook time.
- Protection against exposure to microwave energy: Safety interlocks in the oven doors prevent or terminate microwave operation when either the oven door or filter door is open.

Power Off

The power switch is on the lower right side, toward the front when you are facing the oven. Push the power switch toward the bottom of the machine to de-energize.

OTHER OVEN OPERATIONS

Cool Down

An alternative to turning the power switch OFF when cooking is finished for the day is the "COOL DOWN" mode. This mode turns off all the major components but still allows the cooling fan to operate to keep the internal temperatures of the oven electrical parts down while the oven is cooling. To select "COOL DOWN" press the "COOL DOWN" button followed by the "ENTER" button. Opening the oven door will shorten the cool down time.

Warm Up

To remove the oven from "COOL DOWN" and return to the ready to cook state, press the "WARM UP" button. Make sure the oven and filter doors are securely closed. Remember, the oven may take up to 30 minutes to warm up.

Stop Key

The "STOP" key can be utilized to stop the Cook Setting at any point in the cook cycle. The Cook Setting may be continued by pressing the "RESUME" key. The "STOP" key is also used to exit other modes such as "EDIT" or "MAINTENANCE".

Darker Key

The "DARKER" key may be used to cook the food an additional 25% of the last cooking event. This may be useful to brown the food product or make the product well done.

Resume Key

The "RESUME" key allows a Cook Setting which was interrupted by the "STOP" key or opening the oven door to continue.

MAINTenance, Edit, and Heat Keys

Described in the section on DEVELOPING COOK SETTINGS AND PROGRAMMING.

2.3 Developing Cook Settings and Programming

2.3.1 How to Develop your Cook Settings

Cooking with a TurboChef oven is different and exciting! It delivers hot food faster, at a higher quality than other ovens available today.

TurboChef uses both hot air and microwave energy to cook food. If you have experience with either a convection oven or microwave oven you will see similarities and significant differences. The key to creating good cook settings for your food is to understand the following rules of thumb. When you get a list of cook settings you are happy with, write them down and store the list in a safe place.

1. TurboChef uses a moving shroud of hot air to surround the food. This locks in the food's moisture.
2. The hot air provides coloring and crispness of most foods. The higher the air velocity, the faster heat energy is transferred to the exterior surface of the food.
3. The microwave provides heat to the center of the food. Don't try to do all the cooking with microwave!
4. The weight of food determines the total time required to cook. The more weight, the longer the time required. (Most medium thick crust pizzas cook in about 100 seconds.)
5. Be careful to balance the use of microwave on thick or frozen products. A tendency will develop to overcook the edges before reaching the desired internal temperature.
6. Microwave seems to work best in the early stages of cooking, then use hot air to finish the cooking. Although a continuous lower level of microwave is beneficial for thick or frozen foods.
7. Color seems to develop mostly at the end of the cooking cycle. Higher velocity air in the later stages of cooking will strongly control the food's color.

Don't be afraid to experiment! Write down your current cook settings and then start testing. You can always go back to the old cook settings in a few seconds. Enjoy the power and flexibility of your TurboChef System.

2.3.2 Reviewing Existing Cook Settings

NOTE: The EDIT feature is not available on some of the EC oven versions. COOK and HEAT settings must be input through the RS 232 connector on the control card.

1. Press the EDIT key, key in the Access Number (PIN) and press ENTER.
2. Press the Recipe GROUP key you wish to review and observe the group name.
3. Press ENTER.
4. Press a SUBGROUP key, key 1 through key 6, and the subgroup name appears to the right of the GROUP name.
5. Press ENTER and observe the Duration in seconds, the percentage of hot air flow (Air), and the percentage of microwave (TW) for the first event of the cook cycle.
6. Press ENTER and the second event parameters are displayed. The Cook Setting ends when an event with zero time duration is encountered or all four events are used. If the first event of a Cook Setting has a duration of zero time, no Cook Setting is defined.
7. Press EDIT to return to step 2.
8. Press HEAT and observe the cook temperature set point. The cook temperature set point applies to all GROUP/SUBGROUP cook settings.
9. Press STOP to return to normal operation.

2.3.3 Editing Cook Settings

NOTE: The EDIT feature is not available on some of the EC oven versions. COOK and HEAT settings must be input through the RS 232 connector on the control card.

1. Press the EDIT key, enter Access Number (PIN) and Press ENTER.
2. Press the Recipe GROUP name key of the Cook Setting you wish to edit.
3. Edit the food group name using the left/right arrow keys to position the blinking cursor. Nine characters are available for the food group name. Repeat pressing an alpha/numeric key until the needed letter or number appears. The up/down arrow keys select upper case or lower case letters. Use the right arrow key to advance to the next character position. The SP key replaces a character with a space and advances to the next character position. Press ENTER when the new name is complete. Note: When the existing information is correct, simply press ENTER to store the information and move to the next display.
4. Press a SUBGROUP key number, 1 through 6, to indicate quantity or special food definition.
5. As described in Step 3, likewise edit the subgroup name. Press ENTER.
6. Observe the three parameters for cook event 1. The blinking cursor indicates the Event Duration is selected for editing. Use the left/right arrow keys to select the other parameters, blower power (AIR) or microwave power (TW).

7. Using the numeric section of the keypad, key in the correct time or percentage and press ENTER. The blinking cursor will advance to the next parameter. Note: You must press ENTER to replace previous settings with new settings. Be careful not to change a setting and move the blinking cursor without pressing ENTER to save the setting.
8. If a setting is not changed and ENTER is pressed, the display will advance to the next event. Use the up/down arrow keys to select any of the 4 events to edit or review.
9. When 4 events are not required for the cook setting, set the duration of the first unused event to 0. Note: If the duration of event #1 is set to 0, the GROUP/SUBGROUP selection has no cook setting and displays "NO RECIPE ENTERED" when selected.
10. Valid event duration time is 1 to 255 seconds. However, the combined duration of all events, i.e., the total Cook Setting cook time, should not exceed 999 seconds. Valid blower power (AIR) is 20% to 100% in 5% increments. Valid microwave power (TW) is 0%, 50%, or 100%.
11. Anytime you wish to select a different Cook Setting to edit, press EDIT and return to step 2.
12. To review or edit the Cook Temperature Set Point, press HEAT. Enter a new temperature from the numeric keys and press ENTER. Note: The same Cook Temperature Set Point applies to all GROUP/SUBGROUP Cook Settings.
13. When editing is complete, press STOP to return to normal cook mode.

2.3.4 Maintenance Operations

The MAINTenance mode allows you to manually control the various hardware components of the oven and display operational information

Press the MAINTenance key, enter access number (PIN) and press ENTER.

1. VER key alternately displays the version of the oven operating system (hardware and software) and the oven recipe version if loaded by the TurboComm utility.
2. HTR key turns the Heat Exchanger On and Off. If the heat exchanger is over the maximum allowed temperature (Approximately 700 degrees F), the heaters can not be turned on. An over temperature thermostat also prevents heater runaway. LED 11 indicates heaters are selected (Note: early "B" versions do not use LED 11.) and LED 16 indicates current is flowing to the heaters. This key also resets the COOK TEMP TOO LOW message.

CAUTION: DO NOT leave the heaters on for long periods, as the oven will rapidly heat to maximum allowed temperature (Approximately 700°F(371°C)).

3. %BLO key increases the convection air flow in 10% increments. Repeat pressing key to select new air speeds. When the air flow is 100%, the next key press resets air flow to 0%. If the blower is Off (LED 7 is not illuminated) the %BLO key is ignored.
4. BLR key turns the convection air blower On or Off. LED 7 indicates the status of the blower motor speed controller. The blower will return to controlled operation when MAINTenance is exited. This key also resets the BMSC DEFECTIVE message.
5. M1 key energizes magnetron 1 when the key is held depressed. To conserve power, the Heat Exchanger is turned OFF when the key is pressed. The display provides an un-calibrated indication of the power level in the microwave waveguide cavity. The power reading varies with the motion of the microwave stirrer blade. The magnetron turns OFF when the key is released. This key also resets the Mag RF FLUC LOW and Mag CURRENT LOW messages.

CAUTION: DO NOT hold the key more than 5 seconds without a cooking product or suitable microwave load in the oven.

6. M2 key energizes magnetron 2 as described in step 5.

CAUTION: DO NOT hold the key more than 5 seconds without a cooking product or suitable microwave load in the oven.

7. M12 key energizes both magnetrons 1 and 2 as described in step 5.

CAUTION: DO NOT hold the key more than 5 seconds without a cooking product or suitable microwave load in the oven.

8. PIN key allows for entry of an alternate personal identification number for accessing EDIT and MAINTenance modes. If TurboComm is implemented, the PIN will also reset the “New Settings” message. Enter from 1 to 4 numbers or letters and press ENTER. Be sure to keep a record of the PIN you choose. *Note: this function resets the previous PIN number.*
9. CCC key displays the Cook Cycle Count. Press key a second time and a message prompts to press SP/CLR (Group 14 key/MICRO) to reset the count to zero.
10. EC key displays the temperature of the electronics compartment. If the EC thermocouple is open or missing, “EC THERMO OPEN” is displayed. The EC temperature should not exceed 140°F(60°C) under normal conditions.

11. WARM key causes the MAINTenance mode to be exited and the WARM-UP mode to be selected without executing SELF-TEST.

12. DIAG key performs two functions. The first press displays the heat exchanger rate of temperature rise, degrees per minute. This number is used by the oven operating system to replace heat lost during cooking and maintain cook temperature when the oven is idle. If MAINTenance mode is exited after the first press, a diagnostic display is presented during cook and heat maintenance cycles. The display shows all parameters, RF power, percent air flow, CC and HX temperature, and the accumulated and target BTU during cooking for each event.

    The second press indicates if the temperature rise was measured or defaulted to the last known measurement. The measurement is taken during oven warm up when the initial cook chamber temperature is less than one half the cook temperature set point. To keep the normal display, exit MAINTenance after the key press showing the measured or default message.

13. IAF key selects the amount of air flow when the oven is idle (not Cooking). When IAF is first pressed, the current Idle Air Flow is displayed. The IAF range is 0% to 50% in 5% increments. Repeat pressing the IAF key to select a new air flow. Then press ENTER to set the new IAF.

14. CURE key places the oven in a state for curing RTV sealant. All oven functions except the Heat Exchanger are turned Off. The HX is maintained at 200 degrees F. A 6 hour count down is started with the display updated each second to show the remaining time. At the end of 6 hours, the oven automatically enters the Cool Down state (the Heat Exchanger is turned Off). Press Warm Up to return to normal operation. During the cure count down, press any key and enter a valid PIN to return to MAINTenance.

15. SN key is used to enter the oven serial number. The first time SN is pressed the current serial number is displayed. A second press clears the serial number field and awaits entry of a new number. Up to 6 numbers may be entered. The serial number is updated when ENTER is pressed.

16. FF key is used to display and reset oven fault flag counters. Repeat pressing the FF key to display the 6 faults, BMSC Status, Low Cook Temperature, Low Mag Current, Low RF Fluctuation, Mag Thermo Switch, and EC Over Temperature. The counters increment from 0 to 255 and roll over to 0. To reset a counter, repeat pressing FF to select the fault and press SP/CLR.

Press the MAINTenance or STOP key to return to normal cooking operation. The magnetrons and heaters are turned OFF, the blower controller is returned to the ON or operational state and the air flow is set to the IAF setting before returning to normal cooking operation.

2.3.5 Replacing Keypad Menu Label Strips

1. Remove menu label strips by inserting a small pointed object, such as a wooden toothpick, under the keypad film and pull out until the strip appears and can be removed by hand. Use caution in order to avoid damaging keys, cutting the keypad film or scratching the stainless steel panel.
2. Install a new menu strip by holding the keypad slot open with a small pointed object and sliding the new menu strip into place. Again, use caution to avoid cutting the keypad film or scratching the stainless steel panel.

2.4 Control Panel Layout

2.4.1 Keypad Layout

Group A VER	**Group E** M1	**Group J** CCC	**Subgroup 1** IAF ABC1	**Subgroup 2** SN DEF2	**Subgroup 3** GHI3		**MAINT**	**STOP**
Group B HTR	**Group F** M2	**Group K** EC	**Subgroup 4** CURE JKL4	**Subgroup 5** FF MNO5	**Subgroup 6** PQR6		**EDIT**	**WARM UP**
Group C % BLR	**Group G** M12	**Group L** WARM ⇑	**Group N** STU7	**Group P** VW8	**Group R** XYZ9		**HEAT**	**DARKER**
Group D BLR ⇐	**Group H** PIN ⇒	**Group M** DIAG ⇓	**MICRO** SP/CLR	**AIR+MICRO** 0	**AIR** ENTER		**COOL DOWN**	**RESUME**

NOTE: Subscripts used in MAINTenance and EDIT modes only.

2.4.2 Status LED Indicator Layout

Cook Door Primary	1 •	• 9		
Cook Door Secondary	2 •	• 10		
Cook Door Monitor	3 •	• 11	Heat Exchanger *	
Filter Door Primary	4 •	• 12	Magnetron 1 Temperature OK †	
Filter Door Secondary	5 •	• 13	Magnetron 2 Temperature OK †	
Filter Door Monitor	6 •	• 14	Magnetron 1 On	
Blower Running	7 •	• 15	Magnetron 2 On	
	8 •	• 16	Heat On	

When light is on, item is active.

* LED 11 is not connected on early “B” Version Ovens, LED 11 is connected on ovens with Serial Numbers greater than 100,000.

† LED’s 12 and 13 are connected on “B” Version Ovens only.

3.0 TROUBLESHOOTING

3.1 Basic Maintenance Procedures - Care and Cleaning

Oven cleanliness must be maintained to insure proper cooking. In particular the following areas should be checked.

1. In order to improve food color and crispness, check for convection air blockage in:
   a) Chamber Basket.
   b) Grease Filter (In Filter Box).
   c) Holes in roof of Oven Cooking Cavity.
   d) Holes in Cooking Platter.
2. To maintain 100% microwave power, frequently clean all carbon deposits from:
   a) Cook Platter.
   b) Waveguide Cap
   c) Inside of Oven Cooking Cavity.
3. To insure the lifetime of the oven:
   a) **Do not** operate with metal in the Oven Cooking Cavity.
   b) **Do not** operate with a damaged or missing Waveguide Cap.
   c) **Do not** operate with a clogged cooling air filter.

3.2 Self Test and On-Line Error Messages

3.2.1 SELF TEST - Defective Messages (Rev R Software).

Refer to 3.3 Self Test Flow Chart to determine logic tests performed.

Note: When a "… Defective" Message is encountered, the operator may press any key to continue the self-test. The software will track this fault for future verification.

Displayed Message	GoTo	Page
1. "BMSC DEFECTIVE"	4.3	25
2. "HX Heat Thermo OPEN"	4.7	32
3. "HX Heat °F RISE LOW"	4.7	32
4. "CC Heat Thermo OPEN"	4.7	32
5. "CC Heat °F RISE LOW"	4.7	32
6. "Mag 1 (2) CURRENT LOW"	5.4	36
7. "Mag 1 (2) RF FLUC LOW"	5.4	36
8. "Mag 1 (2) THERMO SW"	5.4	36
9. "Oven Door Open"	6.2	43
10. "Filter Door Open"	7.0	44
11. "Keypad DEFECTIVE"	8.3	46

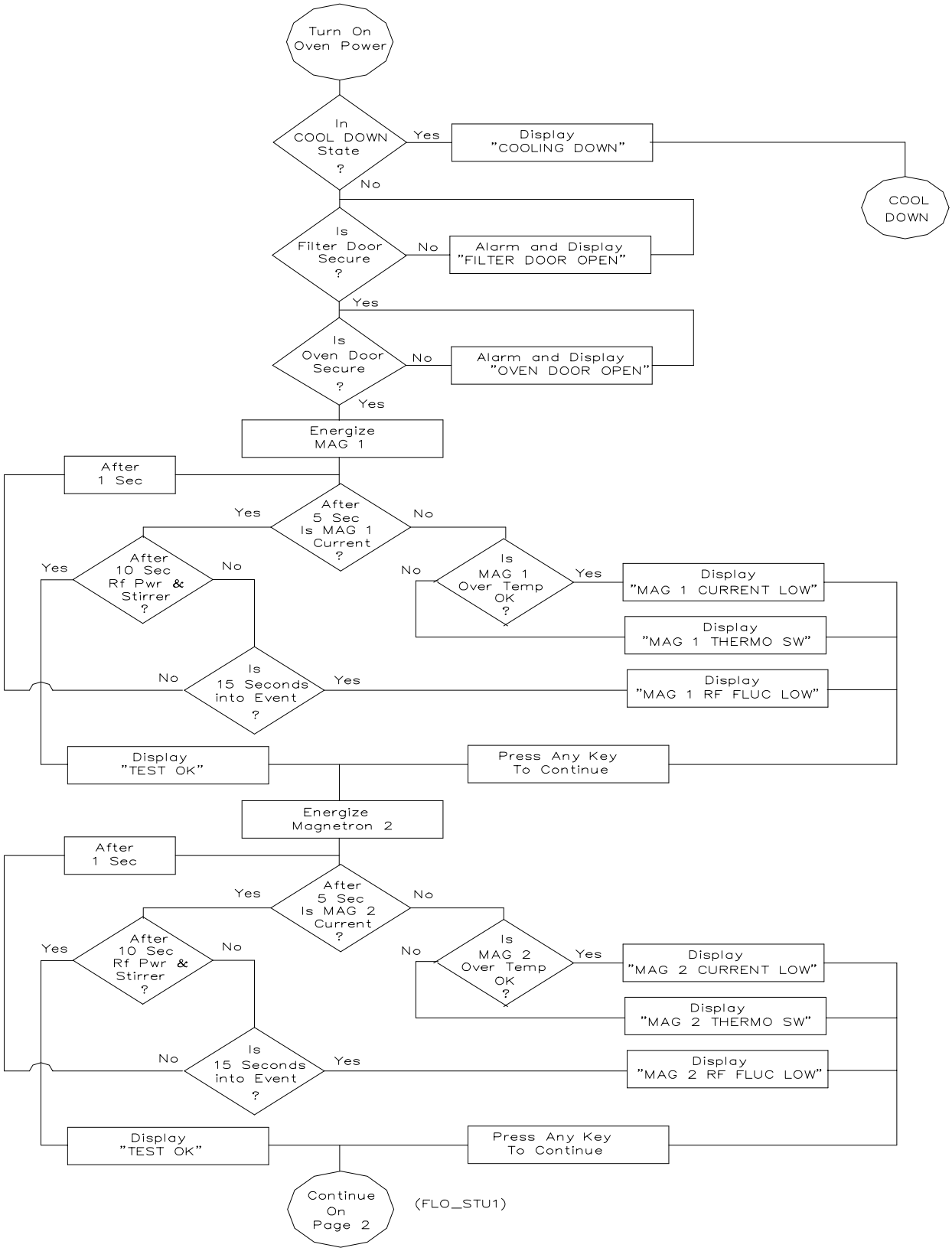
3.2.2 ON LINE (while cooking) - Diagnostic Messages (Rev R Software).

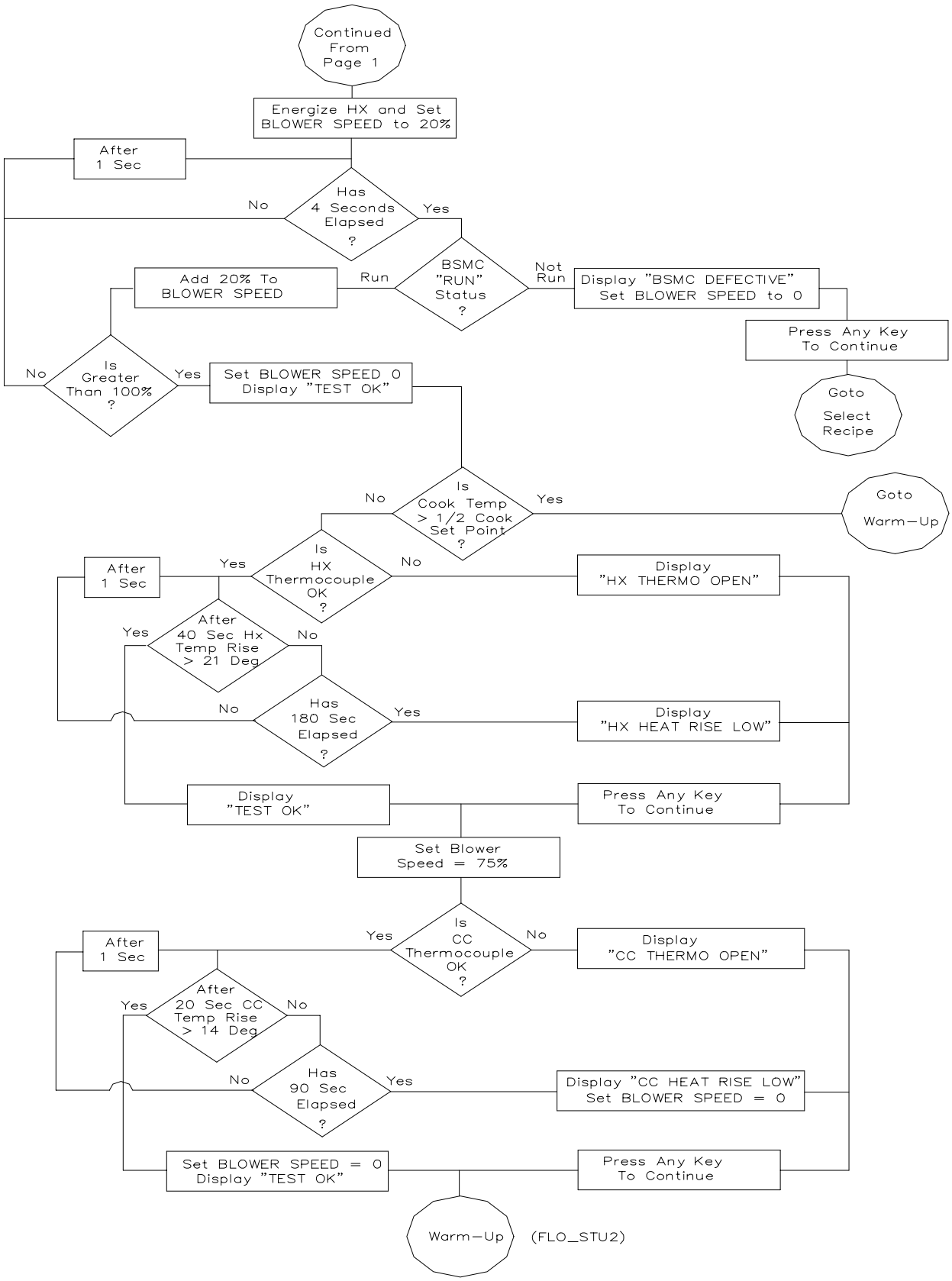
Refer to 3.4 On-Line Flow Chart to determine logic tests performed.

Note: Only “Cook Temp Too Low” and “BMSC DEFECTIVE” cause a cook cycle to terminate. Magnetron failures as well as cook temperature variances cause cook cycle time extensions (shortening) to compensate for lost (increased) available cooking energy. Each time another cook cycle is started, the faults are reset and retested.

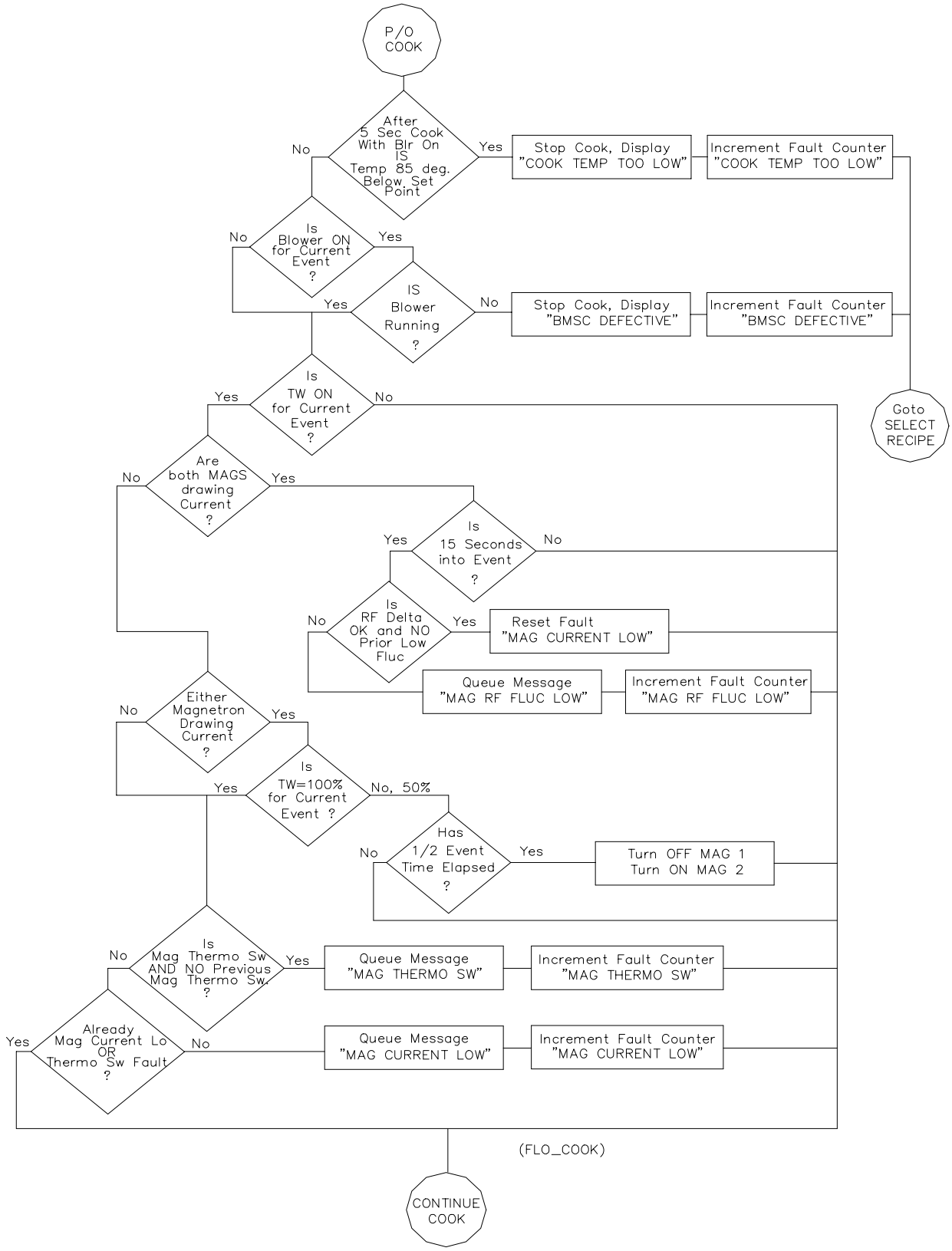
Displayed Message	GoTo	Page
1. “BMSC DEFECTIVE”	4.3	25
2. “COOK TEMP TOO LOW”	4.7	32
3. “EC Temp ___ °F”	8.2	46
4. “Mag CURRENT LOW”	5.4	36
5. “Mag RF FLUC LOW”	5.4	36
6. “Mag THERMO SW”	5.4	36

3.3 Self Test Flow Chart




Continued From Page 1
Energize HX and Set BLOWER SPEED to 20%
After 1 Sec
Has 4 Seconds Elapsed ?
No
Yes
BSMC "RUN" Status ?
Run
Not Run
Add 20% To BLOWER SPEED
Display "BSMC DEFECTIVE" Set BLOWER SPEED to 0
Press Any Key To Continue
Goto Select Recipe
Is Greater Than 100% ?
No
Yes
Set BLOWER SPEED 0 Display "TEST OK"
Is Cook Temp > 1/2 Cook Set Point ?
No
Yes
Goto Warm-Up
After 1 Sec
Is HX Thermocouple OK ?
Yes
No
Display "HX THERMO OPEN"
After 40 Sec Hx Temp Rise > 21 Deg
Yes
No
Has 180 Sec Elapsed ?
No
Yes
Display "HX HEAT RISE LOW"
Display "TEST OK"
Press Any Key To Continue
Set Blower Speed = 75%
After 1 Sec
Is CC Thermocouple OK ?
Yes
No
Display "CC THERMO OPEN"
After 20 Sec CC Temp Rise > 14 Deg
Yes
No
Has 90 Sec Elapsed ?
No
Yes
Display "CC HEAT RISE LOW" Set BLOWER SPEED = 0
Set BLOWER SPEED = 0 Display "TEST OK"
Press Any Key To Continue
Warm-Up
(FLO_STU2)

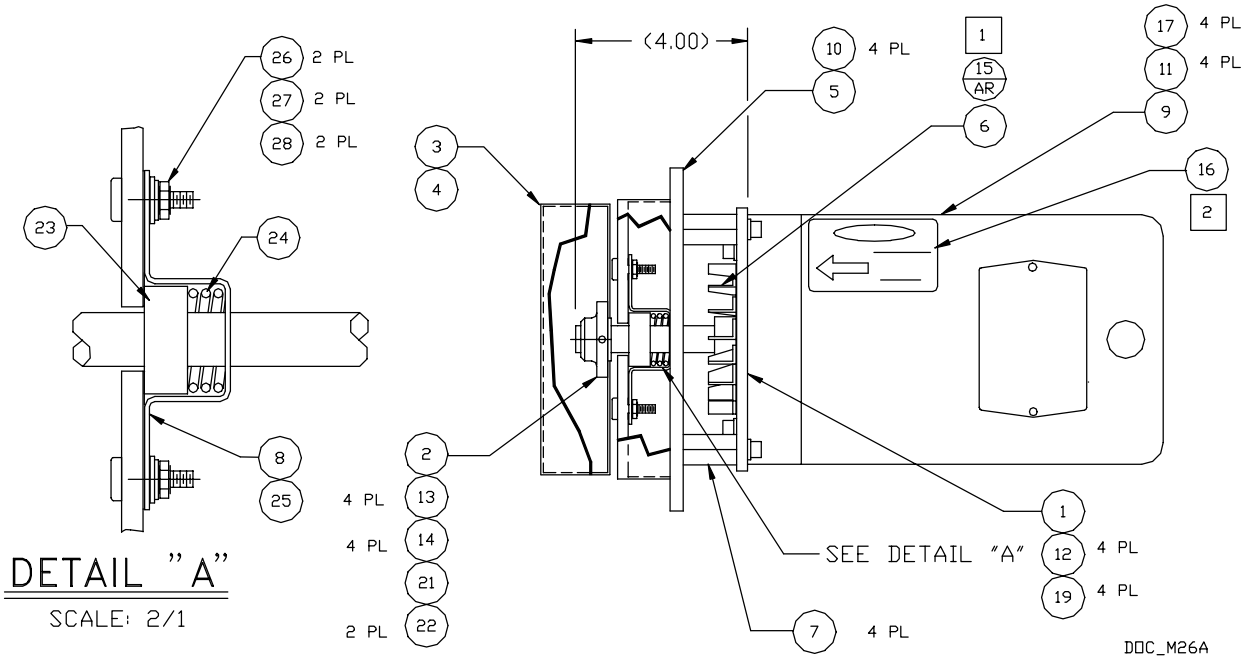
3.4 On-Line Flow Chart



4.0 CONVECTION SYSTEM
4.1 Blower Motor Assembly

1. BLOWER WHEEL TIPS FACE AWAY FROM MOTOR (AS SHOWN).

2. LABEL ORIENTATION IS TO BE LEFT TO RIGHT AS FACING MOTOR. LOCATE IN AREA SHOWN, KEEPING LEFT EDGE PARALLEL TO MOTOR FLANGE.



BLOWER MOTOR ASSEMBLY - DWG 700-0310

ITEM	PART NO.	DESCRIPTION
1	700-0304	MOTOR MOUNTING PLATE
2	700-0306-2	HUB, FAN, SMALL
3	700-0307-1	BLADE, FAN
4	700-0308	BLOWER RING
5	700-0311	BLOWER CAP
6	102708	HEAT SLINGER
7	700-0314	STANDOFF, MOTOR
8	700-0284	SHIM, SHAFT SEAL
9	102732	MOTOR, FLANGE MOUNT, 1 HP, 7050 RPM
10	101391	1/4-20 X .75 LG. SCREW, PFH, SS
11	101830	3/8-16 X .75 LG. SCREW, SOCKET HD. CAP, SS
12	101751	1/4-20 X .75 LG. SCREW, SOCKET HD. CAP, SS
13	101746	8-32 X .38 LG. SCREW, SOCKET HD BUTTON, SS
14	102320	# 8 WASHER, LOCK, INTERNAL TOOTH, SS
15	100791	#242 LOCTITE THREADLOCKER
16	700-1154	LABEL, EXPOSED FAN DANGER
17	102410	# 3/8 WASHER, LOCK, SPLIT, SS
18	- - -	NOT USED
19	102400	# 1/4 WASHER, LOCK, SPLIT, SS
20	- - -	NOT USED
21	100730	KEY, WOODRUFF, SS
22	101715	8-32 X .25 LG. SET SCREW, SOCKET HD, SS
23	700-1177	GRAPHITE BLOCK, BEARING SEAL
24	101733	SPRING, COMPRESSION, SS
25	700-1179	CLAMP, BEARING SPRING
26	101005	10-32 NUT, LOCK, CRES
27	102140	# 10 FLAT WASHER
28	102350	#10 SPLIT LOCK

4.2 Blower Motor Controller Tests

The blower motor operates during the normal idle operation (the speed is set by IAF in Maintenance mode for stabilization of the oven temperatures), while in the cooking mode at the desired speed, and during the MAINTenance mode. The MAINTenance mode allows the service technician to manually operate the blower on and off and to change the speed.

Note: The Blower Shaft rotates in the clockwise direction when viewed from front of oven.

4.3 Blower Defective Messages

The TurboChef oven will display a defective (fail) message, “BMSC DEFECTIVE”, if the RUN status from the Blower Motor Speed Controller is absent during self-test or while cooking.

In either case, they can be caused by the following problems:

SELF TEST	WHILE COOKING	CAUSE	CORRECTIVE ACTION
BMSC DEFECTIVE	BMSC DEFECTIVE	Blower Motor Speed Controller not returning the “Running” status. (See indicator LED 7)	1. Check BMSC Temperature. If below 0°C, let controller warm up and try again 2. Check Blower Fuses (See 12.0, Pages 52-60). 3. Check Air Filter for cleanliness. 4. Check Cooling Fan operation. 5. Check for proper operation of interlock/monitor switches. 6. Check fault message on BMSC. (See 4.4.2, Page 26 or Reliance Electric Manual.) 7. Check BMSC Settings. (See 4.5.2, Page 28.) 8. Check all connections in the blower circuit (Ribbon cables, all blue wire signal circuits). 9. Replace BMSC. (See 8.0, Page 45.) 10. Replace I/O CCA. (See 8.0, Page 45.) 11. Replace Blower Motor Assembly. (See 4.1, Page 24.) 12. Replace Controller CCA. (See 8.3, Page 46.)

4.4 Blower Motor Controller Defective Messages

4.4.1 Fault Codes

The SP500 controller requires only minor troubleshooting if a fault should occur. The controller displays fault (ERR) codes which assist in troubleshooting if a fault should occur. If a fault condition occurs while the drive is running, (LED 7 on), the drive will coast to rest and a 2-digit fault code is flashed on the display.

The fault code is also entered into the error log. The error log is designated as “ERR” on the display.

4.4.2 How to Access and Read the Error Log

Fault codes are entered into the error log in sequential order if more than 1 fault should occur. The first error to occur will be flashed on the display and two more errors may be logged into the error log. (The error log must be accessed to see them). After three faults have occurred, no more subsequent faults will be entered into the error log.

The faults entered into the error log are numbered sequentially. If first an overcurrent fault were to occur, it would be in the error log as "1=OC". If next a thermal overload fault were to occur (and the first error was not yet cleared), it would be in the error log as "2=OL", and so on.

The last fault to occur will appear first when accessing the error log. For example, if the last fault was a low bus fault, and the error log has 3 entries, then the error log would display "3=LU" when the error log is first accessed.

Faults are retentive to the error log if a power loss occurs. The entire error log can be cleared by pressing the STOP/RESET button.

* To access the error log:

1. Enter MAINTenance mode on the oven. (Press MAINTenance, enter access code, then press ENTER.)
2. Enter the Program Mode on the SP500 controller. (Press the MODE/ENTER key.)
3. If the display shows "F-00", use the down arrow key to move directly to "Err". Either the up or down arrow key can be used to move through the function list.
4. Press the MODE/ENTER key. (If “ERR” is still displayed, no errors are stored in log.)
5. Press the up arrow key to move through the error codes.
6. Press the STOP/RESET key to clear faults. Refer to 4.4.3.

4.4.3 Messages in Error Log

OH: Thermostat / Drive Overload

Cause	Action
The internal thermostat has caused a trip that indicates excessive temperatures in the controller.	Press the STOP/RESET button (or cycle oven power off for 30 seconds, then on.) The error will not clear until the internal drive temperature is back within range. This may take a few seconds.
1. The ambient temperature of the controller is exceeded.	1. Check Blower shaft to see if it freely turns. 2. Check the Oven Air Filter and verify the Floor Fan is operating (If the oven is hot). Refer to the blower motor/controller test.

OC: Overcurrent

Cause	Action
The current rating of the controller (>200% rated drive current) had been exceeded.	Press the STOP/RESET button (or cycle oven power off for 30 seconds, then on).
This fault can be caused by any of the following conditions:	
1. Short in drive outputs	1. Verify that the input and output wiring to the drive are properly connected
2. Ground fault condition	2. Verify that the output wiring to the motor is not connected to Ground or any other voltage source.
3. Instantaneous overcurrent resulting in greater than 200% rated drive current.	3. Check motor to insure shaft is free to turn.

FL: Function Loss

Cause	Action
The remote (external) function loss signal has been asserted. (Terminals 10 and 11.)	Press the STOP/RESET button (or cycle oven power off for 30 seconds, then on.) This fault will not clear until the function loss signal is unasserted.
1. The external equipment connected to the function loss terminals has failed, or is giving repeated stop requests.	1. Check the external equipment wired to the remote function loss terminals (10 and 11.)
	2. Check function loss connections.

HU: High bus voltage conditions

Cause	Action
The D-C bus charged above the IET threshold level of 430 volts.	Press the STOP/RESET button (or cycle oven power off for 30 seconds, then on.) The error will not clear until the bus falls below the high bus level.
1. Power Line voltage transient has caused the over-voltage condition to occur.	1. If occurrence seldom, possible no problem.
	2. If occurrence is high, suspect incoming power problem or incorrect setting of the SP500 controller (Replace).
2. Deceleration rate to fast (Function 2).	3. Check the decel rate (Function 2), and compare with chart on 4.5.2.

LU: Low bus voltage conditions

Cause	Action
The D-C bus has fallen below the IET low threshold level of 180 volts.	Press the STOP/RESET button (or cycle oven power off for 30 seconds, then on.) The error will not clear until the input line voltage is within the proper range. This may take a few seconds.
1. Momentary loss of input power.	1. Check incoming power.
2. Low line voltage on incoming power.	2. Check incoming power.

Note: If a line dip or momentary power loss occurs and the bus level is able to rise back to the proper range within 500 ms., the drive will automatically restart (if the drive was already running when the fault occurred.) If the drive does not restart, perform above steps, or cycle oven power off for 30 seconds, then on.

OL: Electronic thermal overload

Cause	Action
The electronic thermal overload trip level has been exceeded. This fault protects the drive and motor from overheating due to excessive current within a specified period.	Press the STOP/RESET button (or cycle oven power off for 30 seconds, then on.) The error will not clear until the drive has integrated to the proper range. This may take a few seconds.
1. The Current Limit Setting (Function 5) is not set correctly.	1. Verify the value of Function 5.
2. Function 14, Electronic Thermal Overload is not set correctly to match the motor and controller combination.	2. Verify the value of Function 14.
3. Motor Shaft is bound up or hard to turn.	3. Check motor to insure shaft is free to turn.

Any of the following codes indicate a SP500 motor controller failure.

Codes	Action
AdPF, CH, diSc, EErd, EEOU, EPCH, FSF, In00, In02, In04, In06, In08, In10, In15, noAd, OLP2, rSF, rEF1, rEF2, SELU, UnOP, 7rAP	1. Replace the SP500 controller.

4.5 Blower Adjustments

4.5.1 How to turn Blower On

1. Set the master switch to ON position.
2. Press MAINTenance key. (Refer to Control Panel Layout, Section 2.4, Page 18), enter access code, then press ENTER.
3. Press the (BLR) key if LED 7 is off. Press (% BLR) and verify the blower speed increases in 10% increments until 100% blower speed (7050 RPM indicated on BMSC) is achieved. Verify LED 7 (BM) illuminates on the keypad.
4. Verify that the blower motor rotates freely and does not vibrate from imbalance.
5. Verify that the blower shaft rotates in the clockwise direction when viewing the shaft from the front of the oven.
6. Press (BLR) key to stop the blower motor.

4.5.2 Blower Motor Speed Controller Settings

Although there should be no reason for the Motor Speed Controller to Change Settings, The following is included for setting up a newly installed Motor Speed Controller or in case there is some suspicion that the Settings have changed on an installed Controller.

To Access the Controller Setup:

1. With oven Master switch ON, select "MAINTenance" key and enter access code.
2. Press the MODE/ENTER key on the Controller to select the PROGRAM mode. The Controller PROGRAM Led will be illuminated and the display will show "F-00".
3. Move the up/down arrow keys until the desired function number is displayed.
4. Press the MODE/ENTER key to display the value.
5. Verify the Blower Motor Speed Controller settings by referring to the Controller Nameplate to choose the correct settings from the chart below.
6. Press the up/down arrow keys to change the value, if desired.
7. Proceed to the next function to be verified by pressing the MODE/ENTER key.
8. Press the STOP/RESET key to exit the PROGRAM mode.

BLOWER MOTOR SPEED CONTROLLER SETTINGS

Function	D2-3232	D2-3232-1	D2-3304-1	D2-3356	Function	D2-3232	D2-3232-1	D2-3304-1	D2-3356
F-00	ON	ON	1	1	F-15	ON	ON	ON	ON
F-01	2.0	2.0	2.0	2.0	F-16	2.01 *	OFF	OFF	OFF
F-02	5.0	5.0	5.0	5.0	F-17	----	ON	ON	0N
F-03	3.0	3.0	3.0	3.0	F-18	----	2.10 *	OFF	OFF
F-04	120.0	120.0	120.0	120	F-19	----	----	OFF	OFF
F-05	100	100	100	100	F-20	----	----	OFF ***	OFF ***
F-06	0	0	0	0	F-21	----	----	5	5
F-07	120	120	120	120	F-22	----	----	0	0
F-08	7050	7050	7050	7050	F-23	----	----	20	20
F-09	OFF	OFF	0	0	F-24	----	----	20	20
F-10	8	8	8	8	F-25	----	----	20	20
F-11	100	100	100	100	F-26	----	----	10	10
F-12	0	0	0	0	F-27	----	----	1	1
F-13	OFF	OFF	OFF	OFF	F-28	----	----	230 **	230 **
F-14	100	100	100	100	F-29	----	----	----	SPd
					F-49	----	----	3.01 *	3.10 *

* Read only setting. ** Factory set. Do not change. *** PW=257 (Password)

4.6 Heat Exchanger

The Heater core consists of 18 tubular heating elements, which are divided into sections depending on the model or configuration of the oven. Each individual heater is rated 450 watts @ 240 VAC. Power input terminals H2 and H3 (Buss bars) are in series with the oven Over-temperature Thermostatic Switch, OT1. The Over-temperature Switch senses the rear exterior surface of the Heat Exchanger and opens when the rear surface of the Heat Exchanger exceeds 600°F (315°C), limiting the maximum fault temperature of the heat exchanger. (This corresponds to a Heat Exchanger temperature of approximately 720°F (382°C)). Two Thermocouples are used for oven temperature control, one measures the Heat Exchanger Core Temperature, HX, and the other measures the Air Temperature entering the Cook Chamber, CC.

The Heat Exchanger is used to:

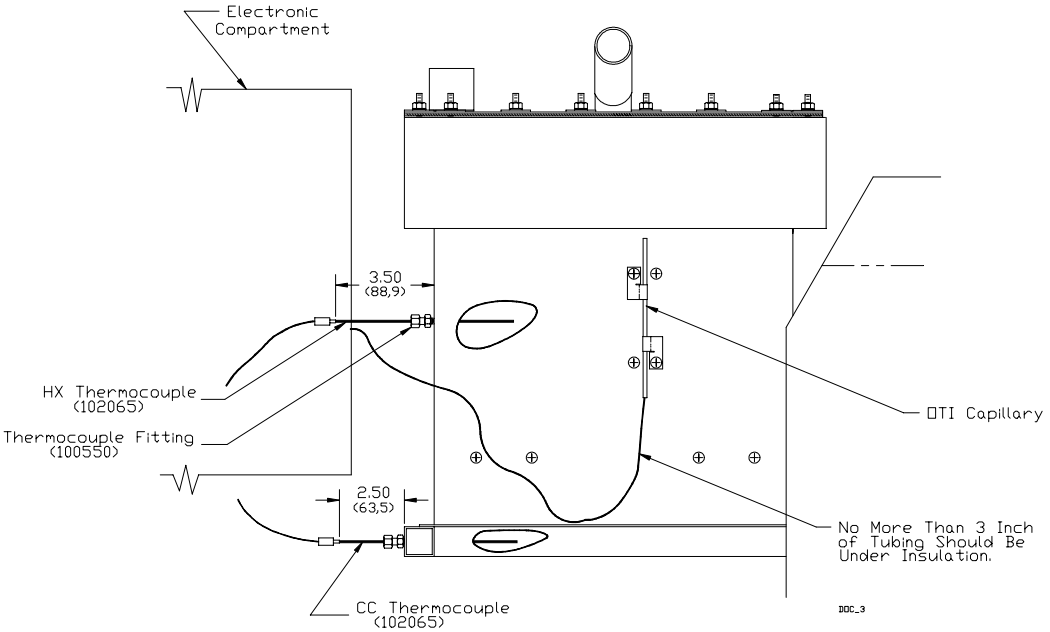
1. Store energy (heat).
2. Provide Thermal uniformity (within the oven).
3. Provide Rapid heating of the Convection (cooking mode) Air.

How to Manually Turn Heaters On:

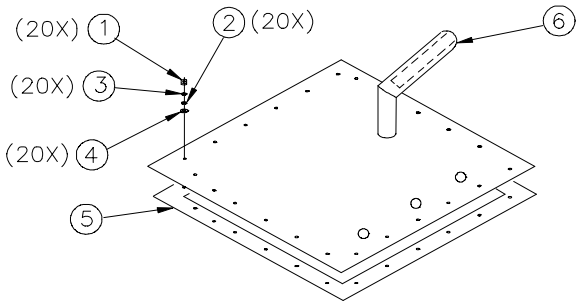
1. Turn oven on.
2. Press MAINTenance key (MAINT).
3. Enter access code.
4. Press ENTER key.
5. Press the HTR key to alternately turn the heater elements on and off.

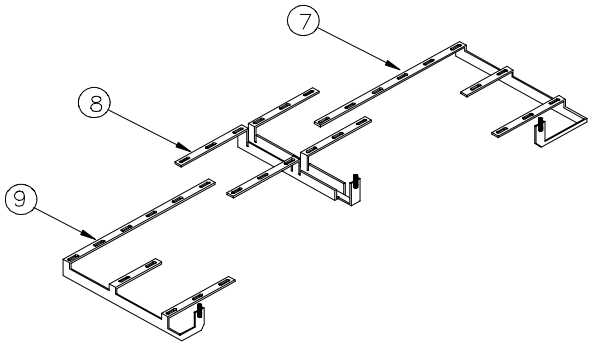
Note: LED's 11 and 16 will come on when the heater elements are on. (LED 11 not used in early "B" version ovens).

CAUTION: DO NOT leave the heaters on for long periods, as the oven will rapidly heat to maximum allowed temperature (approximately 720°F (382°C)).

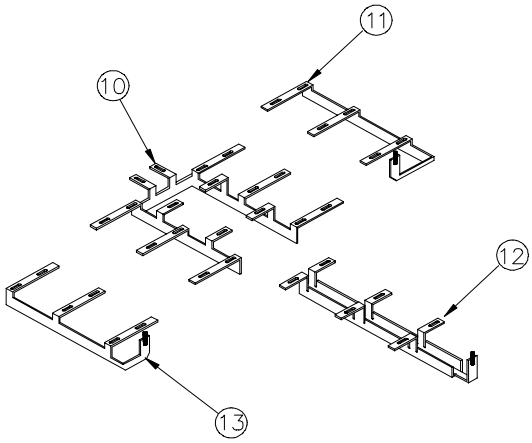


REAR VIEW OF OVEN

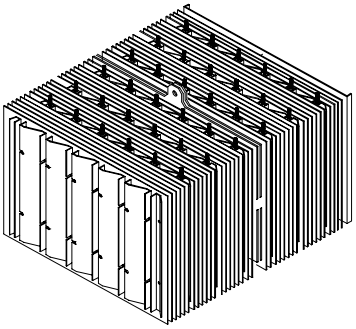




Domestic (U.S.)

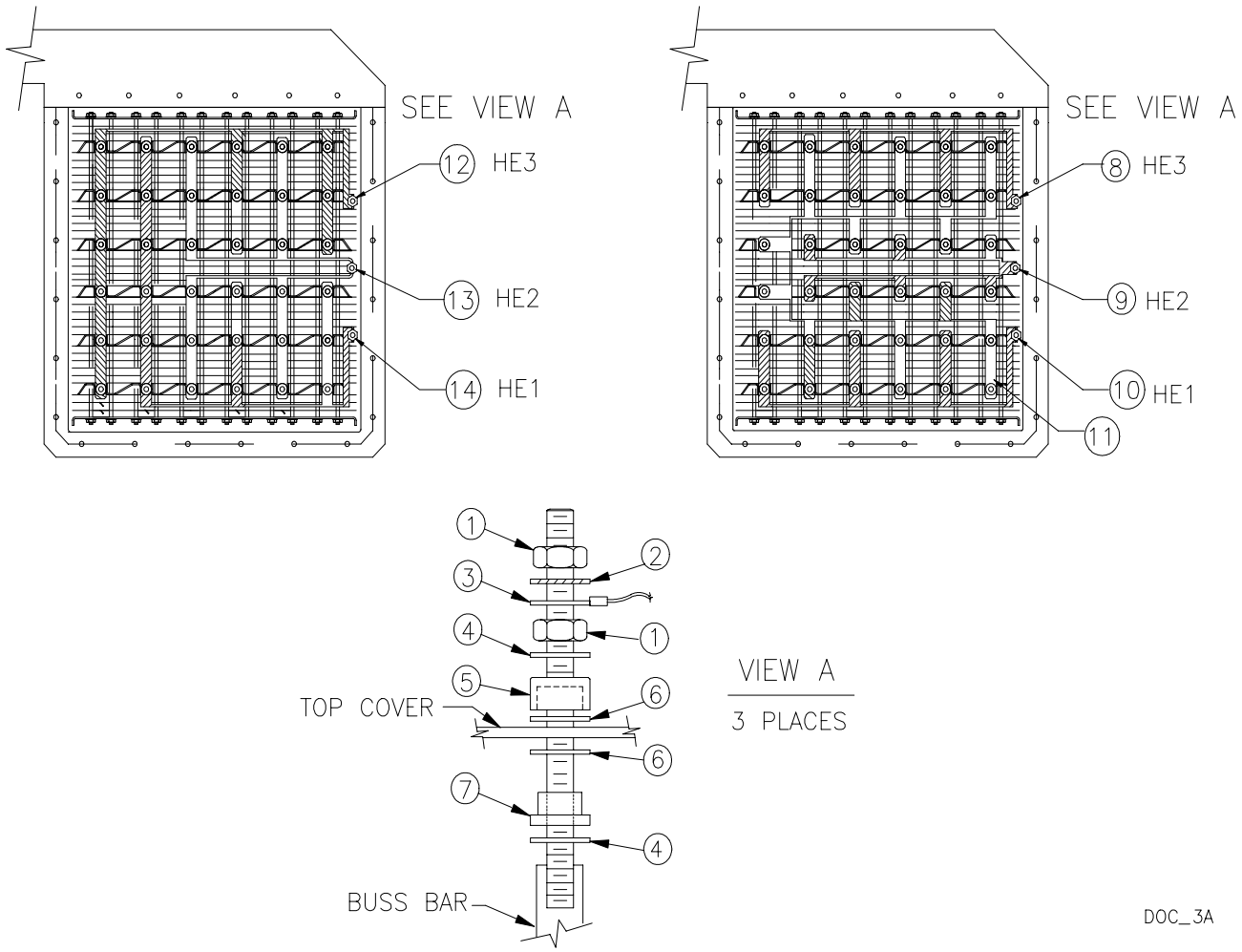


E C Version



HEAT EXCHANGER COVER, BUSS BARS AND CORE ASSEMBLY

ITEM	PART NO.	DESCRIPTION
1	100960	NUT, HEX, SS, 10-32
2	102140	WASHER, FLAT, SS, # 10
3	102350	WASHER, LOCK, SPLIT, SS # 10
4	102130	WASHER, FLAT, SS, # 10 X 1" O.D.
5	700-0449	GASKET, RF, COVER-HEAT EXCHANGER
6	700-0618	FILTER TUBE GREASE
7	700-0456-1	BUSS BAR, INPUT, REAR 3 PHASE
8	700-0455-1	BUSS BAR, INPUT, CENTER, 3 PHASE
9	700-0454-1	BUSS BAR, INPUT, FRONT, 3 PHASE
10	700-0380	BUSS BAR, NEUTRAL, Y, 415 V
11	700-0454-3	BUSS BAR, REAR, 3 PHASE, Y, 415 V
12	700-0455-3	BUSS BAR, CENTER, 3 PHASE, Y, 415 V
13	700-0456-3	BUSS BAR, FRONT, 3 PHASE, Y, 415V



TOP VIEW LOOKING INTO HEAT EXCHANGER (WITH COVER REMOVED)

ITEM	PART NO.	DESCRIPTION
1	100960	NUT, HEX, SS, 10-32
2	102260	WASHER, LOCK, EXT. TOOTH, SS #10
3	100802	LUG, RING, 12 GA #8, HI-TEMP
4	102140	WASHER, FLAT, SS, # 10
5	100150	BUSHING, CUP, 2C0504
6	102120	WASHER, CRANGLAS 6X0004
7	100160	BUSHING, SHOULDER 2C0503
8	700-0454-3	BUSS BAR, REAR, 3 PHASE, Y, 415 V
9	700-0455-3	BUSS BAR, CENTER, 3 PHASE, Y, 415 V
10	700-0456-3	BUSS BAR, FRONT, 3 PHASE, Y, 415 V
11	700-0380	BUSS BAR, NEUTRAL, Y, 415 V
12	700-0456-1	BUSS BAR, INPUT, REAR, 3 PHASE
13	700-0455-1	BUSS BAR, INPUT, CENTER, 3 PHASE
14	700-0454-1	BUSS BAR, INPUT, FRONT, 3 PHASE

4.7 Heat Exchanger Defective Messages

SELF TEST	WHILE COOKING	CAUSE	CORRECTIVE ACTION
HX Heat Thermo OPEN		HX Thermocouple amplifier indicates open, (999°).	See Thermocouple trouble-shooting below.
HX Heat RISE LOW		HX Temperature failed to rise 21°F(11.7°C) in 4 minutes	1. Check heater fuses. (See 8.1, Page 45), If fuses are blown, check for short to chassis on H1, H2, H3. 2. Check input current to Heat Exchanger. There should be no more than 1 amp difference between readings for each of the 3 phases (See Schematic for rated current). 3. Check operation of the heater relay. (See 8.1, Page 45) 4. Check voltage across oven Over-Temp. Thermostat, OT1. (See 8.1, Page 45) 5. Check blower operation (See 4.4, Page 26) 6. Check Cook Temp Set Point. (See 2.3.2, Page 14) 7. Check crimp connections. 8. Replace HX Thermocouple. (See 4.6, Page 29.)
NOTE:	Heaters must be on to check Currents. See 4.6, Page 29 to turn-on heaters.		
CC Heat Thermo OPEN		CC Thermocouple amplifier indicates open	1. Check crimp connections. 2. Replace CC Thermocouple (See 4.6, page 29)
CC Heat RISE LOW		CC Temperature failed to rise 14°F(7.8°C) in 2 minutes after HX test passed with 75% Blower on	1. Check heater fuses. (See 8.1, Page 45) 2. Check blower operation (See 4.4, Page 26) 3. Check CC Thermocouple
	COOK TEMPERATURE TOO LOW	CC Temperature 84°F (47°C) or more below cook set point after 5 seconds or more into cook cycle	1. Check blower operation. (See 4.4, Page 26) 2. Check CC Thermocouple circuitry.

Thermocouple Troubleshooting:

1. **Display Reading 77°(25°C) (Room Temperature)**
   Acceptable condition from a cold start.
2. **Display Reading 999°(999°C)**
   Indicates related thermocouple is open. Check thermocouple connections.

5.0 MICROWAVE SYSTEM

5.1 Measuring Microwave Radiation Leakage

The following RF emissions test must be performed every time a service call is done on a TurboChef oven. Report your findings on the work order.

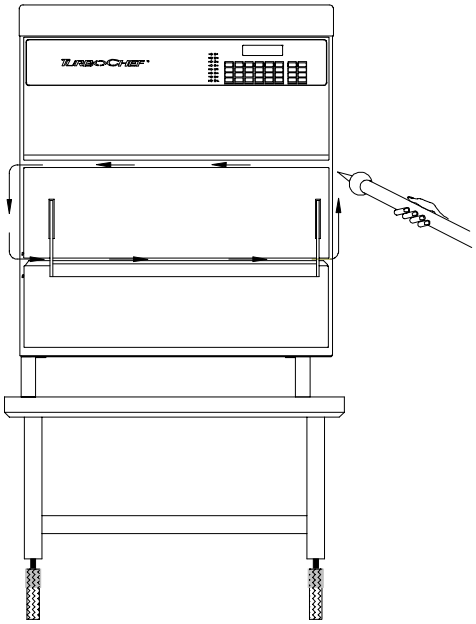
This test must be done in conformance with 21 CFR, Ch1, Part 1030-Performance Standard for microwave and radio frequency emitting products. Part 1030.10 Microwave Ovens. (C) Requirements - (1) Power Density Limit.

> *"The equivalent plane wave power density existing in the proximity of the external oven surface shall not exceed 1 milliwatt per square centimeter at any point 5 centimeter or more from the external surface of the oven, measured prior to acquisition by purchaser, and, thereafter, 5 milliwatt per square centimeter at any point."*

The following areas are to be measured when performing a RF test.

- Cook Door.
- Filter Door.
- At any point on the outside of the oven fully assembled. (With all covers).

Note: Do not operate the magnetron without a load such as 275 ml of water in the cooking chamber. The tip of the survey meter spacer cone should be touching the oven surface being measured, with the probe handle perpendicular to the surface. Move the cone at a speed of less than 0.5 inch per second.



IN CASE THE OVEN FAILS RADIATION LEAKAGE TEST:

WARNING: If the oven fails radiation test , the oven must be taken out of service immediately until the defect is corrected. In addition, the leakage reading and corrective action must be reported on the work order when the defect is corrected and oven placed back in service. If further information is required for this test, please call the TurboChef, Inc. Customer Service Toll Free Number listed on the front of this manual.

5.2 How to Turn Magnetrons On/Off for Testing

The magnetrons may be turned on/off for testing using the MAINTenance mode. The magnetrons will remain on in this mode as long as the appropriate key is depressed.

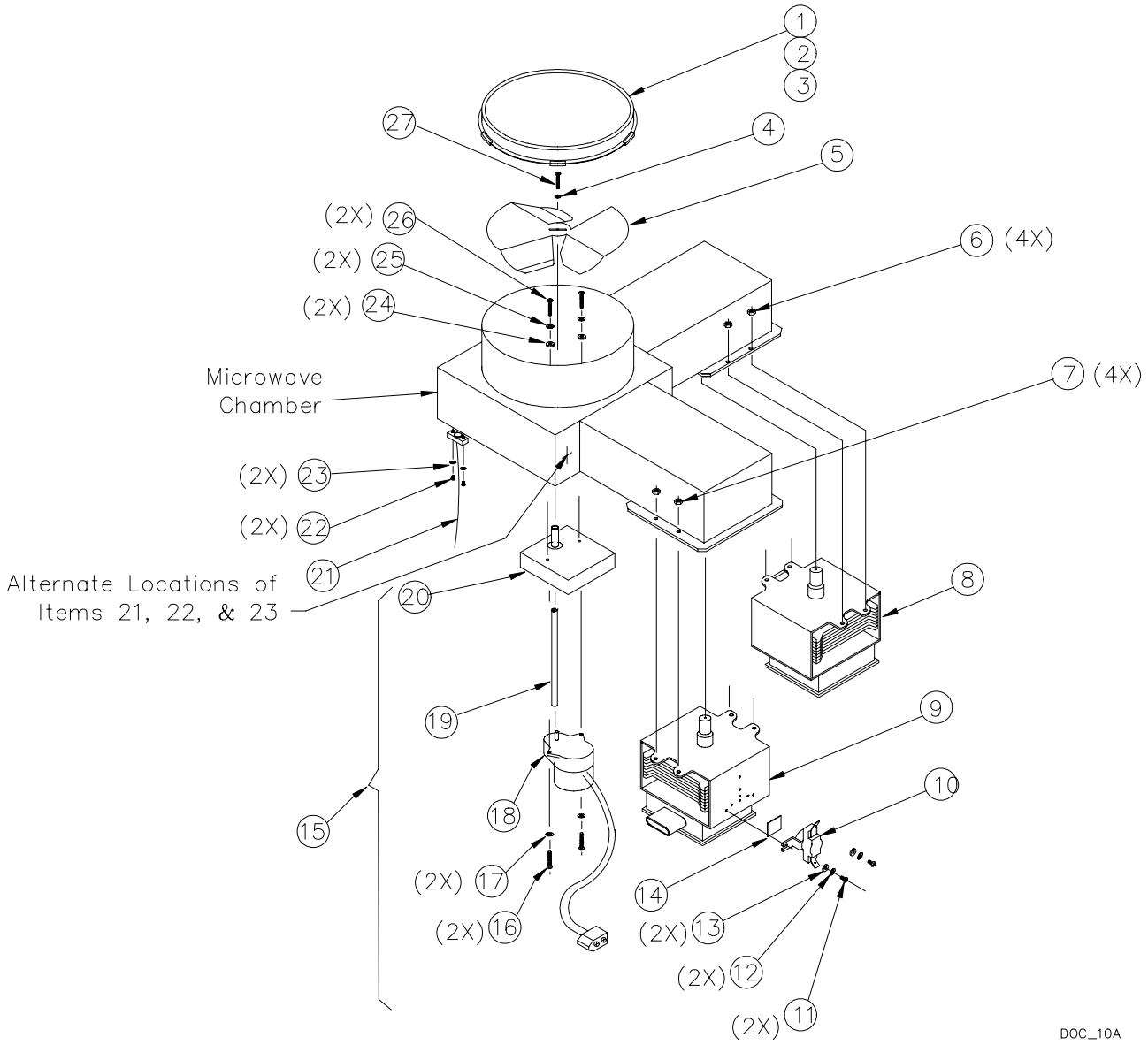
Caution: Do not operate the magnetrons for more than 5 seconds without a load in the cooking chamber. A suitable microwave load is 275 ml (9.3 oz) of cold water.

With the oven in the normal "ON" state:

1. Press MAINTenance key.
2. Enter access code.
3. Press ENTER.
4. Magnetron 1: Press and hold (M1) key. Verify LED 14 (M1) illuminates on the oven keypad.
5. Magnetron 2: Press and hold (M2) key. Verify LED 15 (M2) illuminates on the oven keypad.
6. Both Magnetrons (M12): Press and hold (M12) key. Verify LED 14 (M1) & LED15 (M2) illuminate on the oven keypad LED display.
7. Press the STOP key to return to the normal mode from the maintenance mode.

Note: When energizing the magnetrons (M1), (M2) or (M12), check for fluctuation of RF power on the oven display due to the stirrer blade motion causing the microwave energy to move around in the cooking chamber. The RF power indication should be varying significantly during operation. The RF indication is sampled for 10 seconds. If the difference between the maximum sample and minimum sample is less than 50 units during self-test or 20 units during cooking, the error message "RF FLUC LOW" will be displayed.

5.3 Microwave Component Locations



MICROWAVE COMPONENT LOCATIONS

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	700-1209	PLUG SEAL ASSY, QUARTZ	15	700-1184	STIR MOTOR ASSEMBLY
2	102708	2-270 VO680-70, O-RING (PARKER)	16	101520	SCREW, PPHD, SS, #4-40 X .25
3	102689	59675 HI-TEMP SEALANT (LOCTITE)	17	102300	WASHER, INTERNAL TOOTH, SS, #4
4	102207	WASHER, LOCK, EXT TOOTH, SS,#6	18	102731	MOTOR, SYNCH, 6 R.P.M.
5	700-1188	3 TANG STIR BLADE	19	700-1190	STIR MOTOR SHAFT
6	M5	FLANGE NUT, METRIC, M5, CRES	20	700-1185	MOTOR PLATE ASSEMBLY
7	M5	FLANGE NUT, METRIC, M5, CRES	21	700-0408-2	RF CABLE ASSEMBLY
8	100860	MAGNETRON, 2M121 (HITACHI)	22	101490	SCREW, PPH, SS, #2-56 X .18
9	100860	MAGNETRON, 2M121 (HITACHI)	23	102360	WASHER, SPLIT LOCK, SS, #2
10	102070	THERMOSTAT, 100°C (212°F)	24	102250	WASHER, FLAT, SM. PATTRN, SS, #6
11	101683	SCREW, PPH, TYPE F, #5 X .25	25	102380	WASHER, LOCK, SPLIT, SS, #6
12	102380	WASHER, SPLIT LOCK, SS, #6	26	101590	SCREW, PPH, SS, #6-32 X.38
13	102170	WASHER, FLAT, SS, #6	27	101590	SCREW, PPH, SS, #6-32 X.38
14	100690	INSULATOR, THERMAL SWITCH			

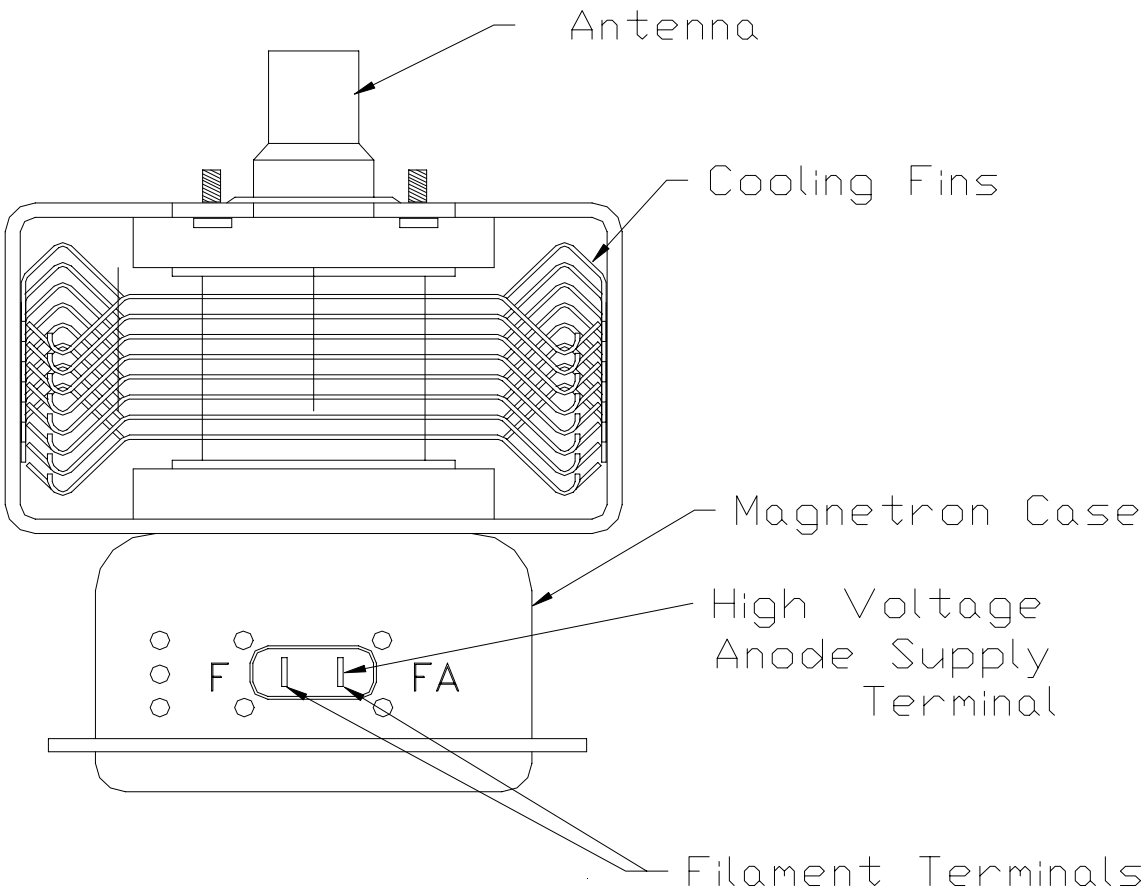
5.4 Microwave Error Messages

SELF TEST	WHILE COOKING	CAUSE	CORRECTIVE ACTION
Mag 1(2) CURRENT LOW	Mag CURRENT LOW	Did not detect current to the magnetron transformer 1(2).	1. Check magnetron fuses. (See 8.1, Page 45). If fuse(s) are blown, check monitor relay and interlock switch operation. 2. Check Mag 1(2) relay operation.) 3. Check Magnetron, magnetron transformer, capacitor, and diode. (See 5.5-5.8, Pages 37-39.) Note: If a magnetron is found to be defective, the failure may be due to the moisture in the waveguide cavity which causes the magnetron to overheat due to high reflected power. If moisture is found in the waveguide cavity, the cavity must be cleaned and resealed. (Refer to Field Service Bulletins 10011.doc & 10019.doc).
Mag 1(2) RF FLUC LOW	Mag RF FLUC LOW **Note:** Stirrer motor operates only when magnetron 1(2) are ON. **Remove magnetron fuses** when inspecting stirrer motor operation.	If magnetrons are ON at least 15 sec. During cook, RF power has failed to fluctuate 20 in 10 sec.	See 5.11, Page 41 for additional information. 1. Check RF power detection cable. (See 5.3, Page 35, Item 21.) 2. Check RF sensor. (See 5.11, Pages 41,42.) 3. Check operation of the stirrer motor Check for any loose wires in the circuit. 4. Check attachment of stirrer blade. 5. Check for loose wires. 6. Change I/O CCA. (See 8.1, Page 45.) 7. Check for failed waveguide seal.
Mag 1(2) THERMO SW	Mag THERMO SW	Detected MAG1 or MAG2 thermal switch, (KLXM1, KLXM2) open. Implying the magnetron case temperature is above 212°F (100°C).	1. Check MAG1, MAG2 over temperature switch. 2. Check for loose wiring in the circuit. 3. Check Air Filter to see if is stopped up or dirty. 4. Check proper operation of magnetron blower (Note: Mag. fan operates only when magnetrons are on.)

5.5 Magnetron

The magnetrons emit RF energy that is coupled to the cook chamber via the waveguide assembly. The RF energy generated by the magnetron occurs at a frequency of 2450 MHz.

Caution: Do not attempt to measure the magnetron voltages with a typical voltmeter. (Voltages are from 4000-4500 VDC.)



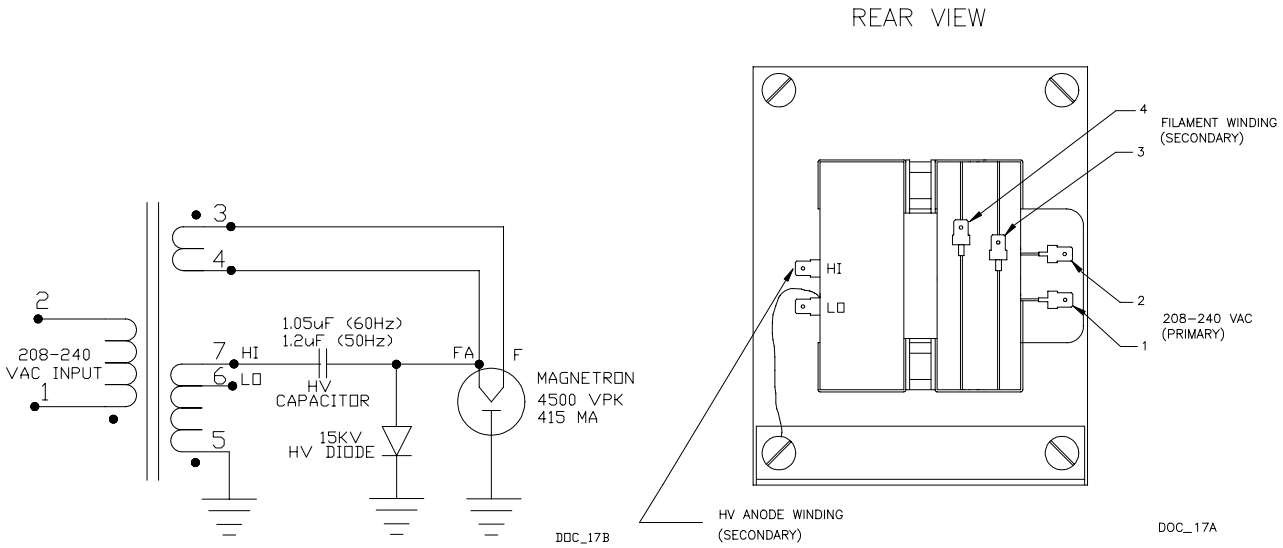
MAGNETRON

How to check a magnetron for open or shorted filaments:

1. Disconnect the ac power source and discharge the High Voltage Capacitors.
2. Isolate the magnetron from the circuit by removing the wires from the F and FA terminals.
3. An ohmmeter connected between the filament terminals (F, FA) should indicate a reading of less than 1 Ohm.
4. A continuity check between either filament terminal and the magnetron chassis should indicate an infinite resistance (open).

5.6 High Voltage Magnetron Transformer

The high voltage magnetron transformer has a primary winding and two secondary winding. The primary winding has 208-240 VAC applied from the line voltage circuit. The secondary filament winding (4.6 VRMS @ 14 Amps) is connected to the filament in the magnetron (F, FA terminals) to supply magnetron filament power. The secondary HV Anode winding (2250 VPK @ 0.83 Amps) is doubled (converted to -4500 VDC @ 0.415 Amps) by the HV diode and capacitor and connected to one side (FA terminal) of the filament. Note: Since the Magnetron Anode is grounded, the anode to filament voltage required is supplied by operating the filaments at a negative potential of 4500 VDC.



HIGH VOLTAGE MAGNETRON TRANSFORMER

Transformer Specifications:

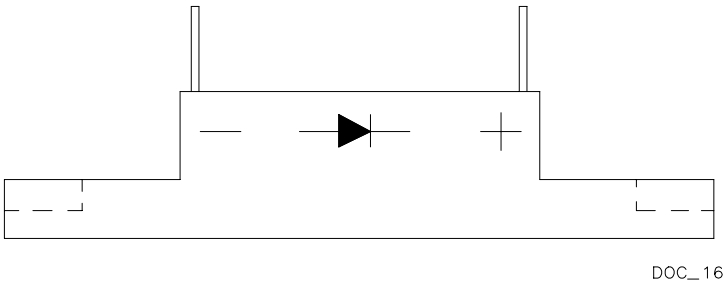
Primary DCR 0.36 Ohm.
Secondary DCR: 50 Ohm
Input Voltage : 208-240 VAC, 60 HZ (50 Hz for EC Version)
Input Current: 9.0 Amps RMS
Anode Voltage: 4500 VDC Peak @ 0.415 Amps
Filament Voltage : 4.6 VAC @ 14 Amps

How to check a transformer:

1. Disconnect the power source and discharge the capacitor.
2. Isolate the transformer from the circuit. (Wires are labeled but remember where they go)
3. Check impedance of the primary and secondary windings. (See above.)
4. Filament winding should read less than 0.1 ohms.
5. Reconnect wires.

5.7 High Voltage Diode

The High Voltage Diode is an assembly constructed by connecting several 1000-1500 volt semiconductor diodes in series to increase the reverse voltage capability. In the circuit, the high voltage diode conducts to prevent the filament voltage from becoming positive, thus as the high voltage winding of the transformer goes to 2250 VPK, the high voltage capacitor is charged to 2250 volts. When the high voltage winding starts to go toward negative, the High Voltage Diode becomes non-conducting with the charged High Voltage Capacitor in series with the High Voltage Winding. When the transformer gets to its negative peak of -2250 VPK, the voltage applied to the filament is negative 4500 volts.



HIGH VOLTAGE DIODE

How to check a diode:

Caution: Do not attempt to measure HV directly.

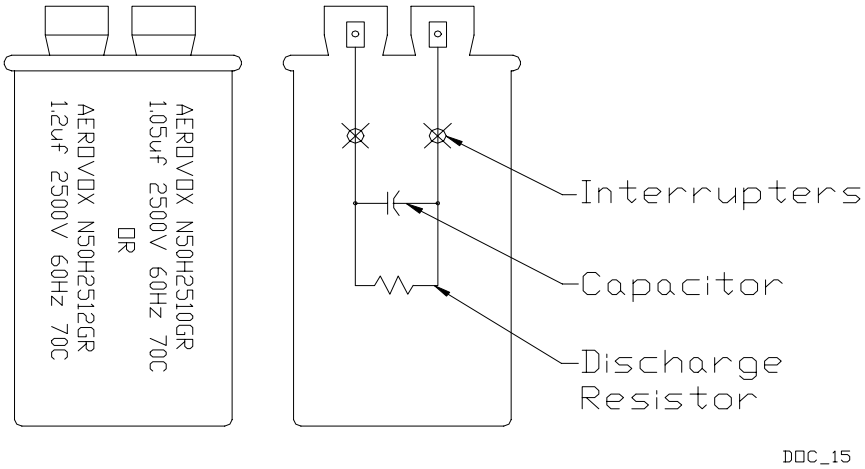
1. Disconnect the oven from the power source.
2. Isolate diode from circuit.
3. Connect the meter leads to the diode terminals.
4. Infinite resistance (open) should be indicated in the reverse direction.
5. Resistance readings in the forward direction may be indeterminate. *
6. If there is continuity in both directions (shorted diode)
7. If infinite resistance in both direction (open diode).*

* Due to the HV diode consisting of approximately 15 X 1000 volt diodes in series the forward diode drop is approximately 9 volts. A normal low voltage ohmmeter will not provide sufficient voltage in the resistance ranges to measure an impedance in the forward direction of the High Voltage Diode.

5.8 High Voltage Capacitor

The High Voltage Capacitor is part of the voltage doubler which stores the transformer peak voltage thus creating a voltage doubler to supply the magnetron with a pulsed -4500 volt dc anode voltage. The capacitor is either 1.05 μF for 60 Hz power or 1.2 μF for 50 Hz power.

Caution: After removing the oven from power and prior to servicing the oven, discharge the capacitor. Never assume the discharge resistor internal to the capacitor has completely discharged the capacitor.



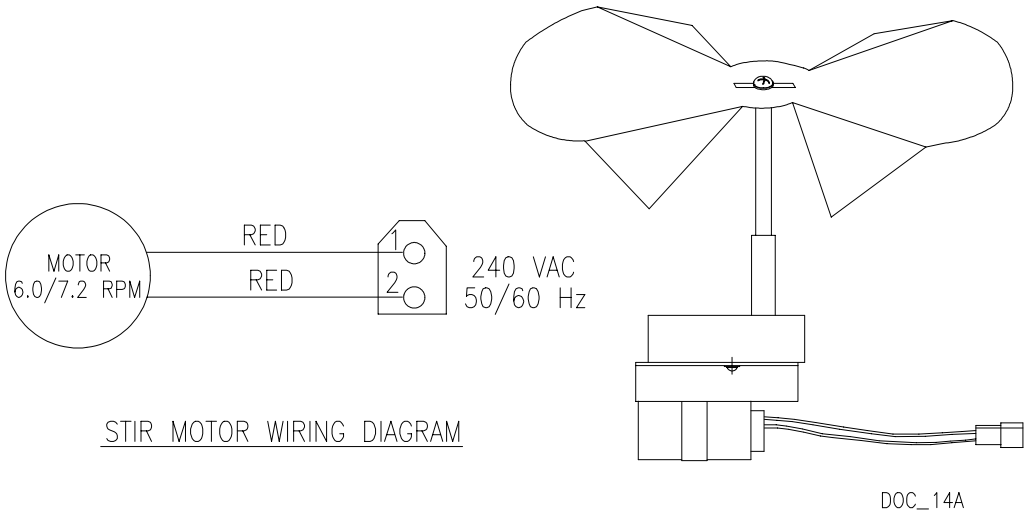
HIGH VOLTAGE CAPACITOR

How to check a capacitor:

1. Disconnect the oven from the power source.
2. Isolate the capacitor from the circuit.
3. Fully discharge the capacitor.
4. Connect the ohmmeter between the capacitor terminals. The meter should momentarily indicate a low impedance and then slowly return to infinite resistance.
5. Reverse the ohmmeter leads. Repeat step 4.
6. Check each terminal to case. Infinite resistance (open) should be indicated.

5.9 Microwave Mode Stirrer

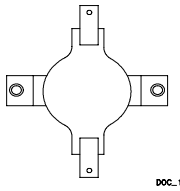
The microwave mode stirrer and associated stirrer blade changes the modal pattern in the cook chamber to reduce hot spots of microwave energy from occurring, thus providing more even cooking. The stirrer motor is a 240 VAC synchronous motor that turns at 7.2 rpm (6 rpm in 50 Hz units).



MICROWAVE MODE STIRRER ASSEMBLY

5.10 Magnetron Over-Temperature Switch

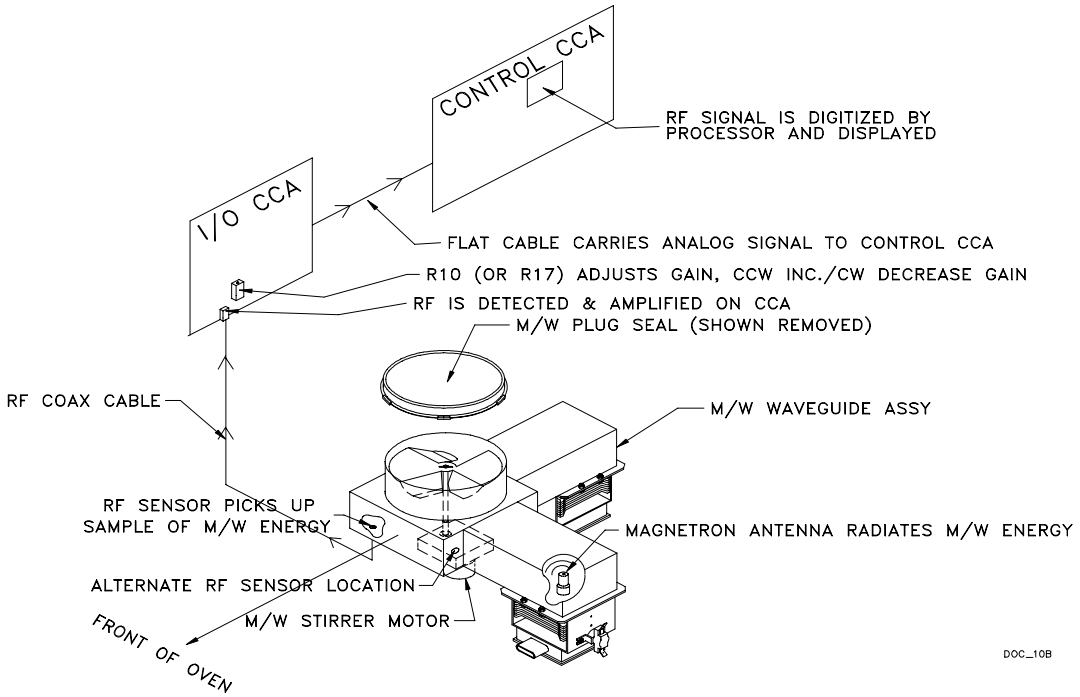
The Magnetron Over-temperature Switch is designed to protect the magnetron from overheating. During normal operation, the switch is closed . The over-temperature switch opens when the magnetron case exceeds 212°F (100°C). Overheating may occur due to a dirty or blocked Air Filter or a failed Magnetron Cooling Fan.



MAGNETRON OVER-TEMPERATURE SWITCH

5.11 RF Output Monitor Circuit

A RF sensor in the microwave waveguide assembly detects a portion of the radio frequency (2450 MHz) energy emitted during the operation of the magnetron(s). A RF Cable Assembly connects the RF Pickup to a SMA connector on the I/O Circuit Card Assembly, CCA. On the I/O Circuit Card Assembly, the RF energy is detected and amplified. The amplifier gain is controlled by R10 on the I/O CCA. The analog signal is then routed via a flat cable to the Control CCA where it is digitized by the microprocessor for control and display. Note: RF readings are displayed in MAINTenance and Diagnostic displays. The readings, measured over a 10 second period, must fluctuate a minimum of 50 units to pass self-test and 20 units to pass the on-line tests (while cooking). The Mode Stirrer rotates once every 8.3 seconds (10 seconds for 50 Hz units).


CONTROL CCA
RF SIGNAL IS DIGITIZED BY PROCESSOR AND DISPLAYED
I/O CCA
FLAT CABLE CARRIES ANALOG SIGNAL TO CONTROL CCA
R10 (OR R17) ADJUSTS GAIN, CCW INC./CW DECREASE GAIN
RF IS DETECTED & AMPLIFIED ON CCA
M/W PLUG SEAL (SHOWN REMOVED)
RF COAX CABLE
M/W WAVEGUIDE ASSY
RF SENSOR PICKS UP SAMPLE OF M/W ENERGY
MAGNETRON ANTENNA RADIATES M/W ENERGY
ALTERNATE RF SENSOR LOCATION
M/W STIRRER MOTOR
FRONT OF OVEN
DOC_10B

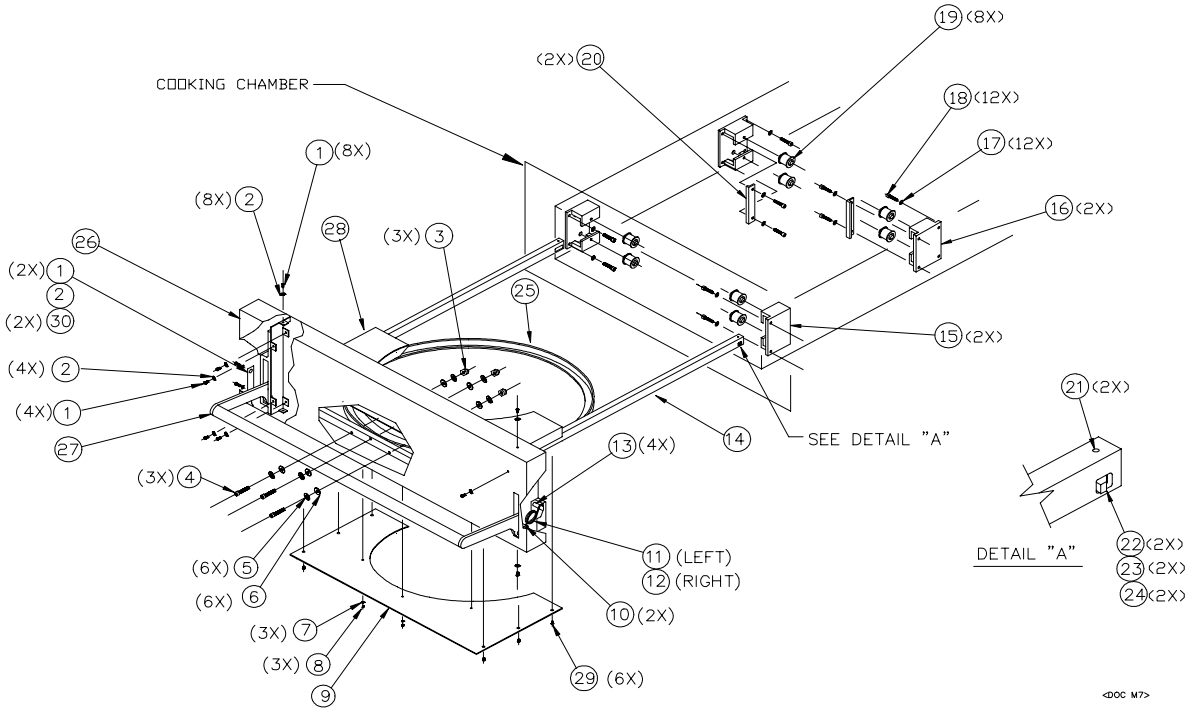
RF OUTPUT MONITOR CIRCUIT

RF output monitor troubleshooting information:

1. Rf reading of 0.
   a) Rf cable is bad, loose or disconnected.
   b) I/O CCA failure.
2. If fluctuations exist but are not fast enough (compared to 10 seconds) check for:
   a) Defective stirrer motor.
   b) Microwave stir blade not turning due to loose setscrew or attaching screw.
3. If fluctuations exist but are low, check for:
   a) Carbon or other trash covering Rf sensor in waveguide cavity.
   b) Bad Rf detector or amplifier on I/O CCA.

6.0 COOK DOOR ASSEMBLY

6.1 Cook Door and Bearing Assembly



COOK DOOR AND BEARING ASSEMBLY

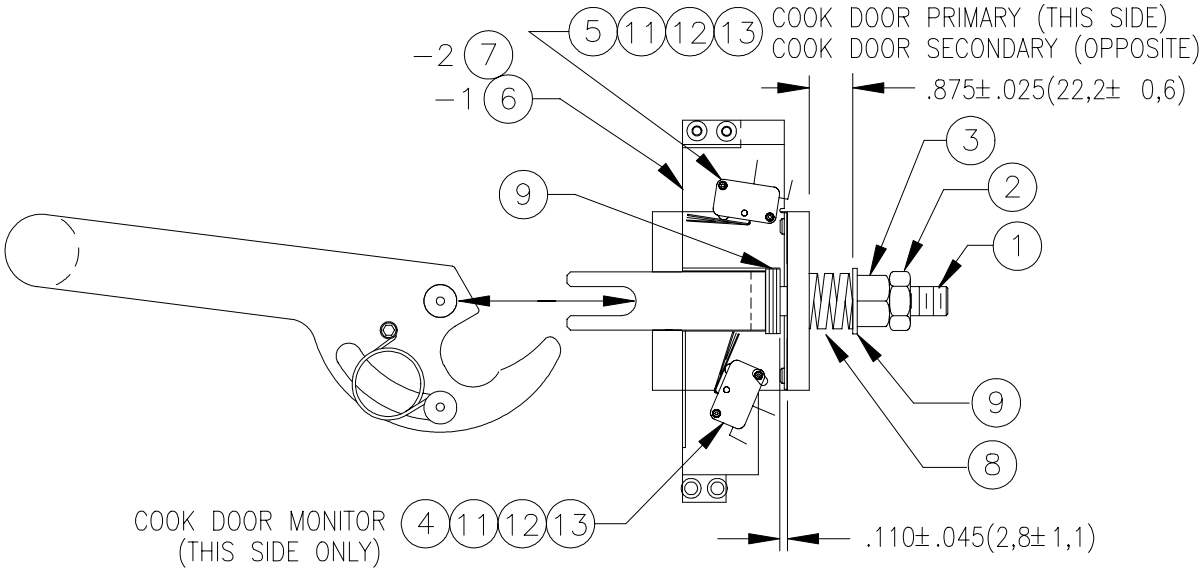
ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	101665	SCREW, PPH, SS, 8-32 X .38.	16	700-0423-1	RAIL, SLIDE, REAR
2	102320	WASHER, LOCK, INT. TOOTH, SS, # 8	17	102320	WASHER, LOCK , INT. TOOTH, SS, #8
3	100910	NUT, ACORN, HIGH CROWN, SS, 1/4-28	18	101747	SCREW, SKT. HD, SS, 8-32 X .50
4	101385	SCREW,HEX. HD, GRADE 8, 1/4-28 X 1.25	19	700-0790-1	BEARING ASSEMBLY
5	102330	WASHER, LOCK, INT. TOOTH, SS, 1/4	20	700-0429	LATCH BAR, RAIL
6	102200	WASHER, FLAT, SS, 1/4	21	101135	PIN, DOWEL, ϕ .125 X .68 LG.
7	102295	WASHER, LOCK, INT. TOOTH, SS, # 2	22	700-0430	LATCH RAIL
8	101495	SCREW, PPH, SS, 2-56 X .38	23	101875	SPACER
9	700-0351	BOTTOM COVER	24	700-0438-1/2	SPRING RIGHT(-1)/ SPRING LEFT(-2)
10	101730	SCREW, SHOULDER, 10-32, ϕ .25X.125	25	700-0214	RING
11	101900	TORSION SPRING, LEFT	26	700-0270	COVER *
12	101890	TORSION SPRING, RIGHT	27	700-0249	HANDLE WELDMENT
13	101855	PRECISION SHAFT ϕ .375 X 2.0	28	700-0215	MOVEABLE WALL
14	700-0288	SLIDE	29	101520	4-40 X .25 LG. SCREW, PPH, SS
15	700-0422-1	RAIL, SLIDE, FRONT	30	700-1169	DOOR PIN RETAINING PLATE
			31	102400	WASHER, LOCK, SPLIT, SS, 1/4

* SOME MODELS USE DIFFERENT HARDWARE TO ATTACH COVER.

6.2 Cook Door and Interlock Switch Adjustments

Door handle alignment is performed with the door closed and latched. The 0.110 (2,8) dimension is adjusted by adding washers, item 9. Adjust the door pressure on the door flange by compressing the 1.00 inch long Die Spring to the 0.875 (22,2) dimension shown.

Door Switch alignment is performed with the door closed and latched. The switch actuators should be centered in the over-travel region of the switch, (between the point that the switch closes and where the switch actuator contacts the switch case). There is one cook door monitor switch (right side) with the primary cook door interlock on the right and the secondary cook door interlock on the left.



DOOR LATCH ASSEMBLY

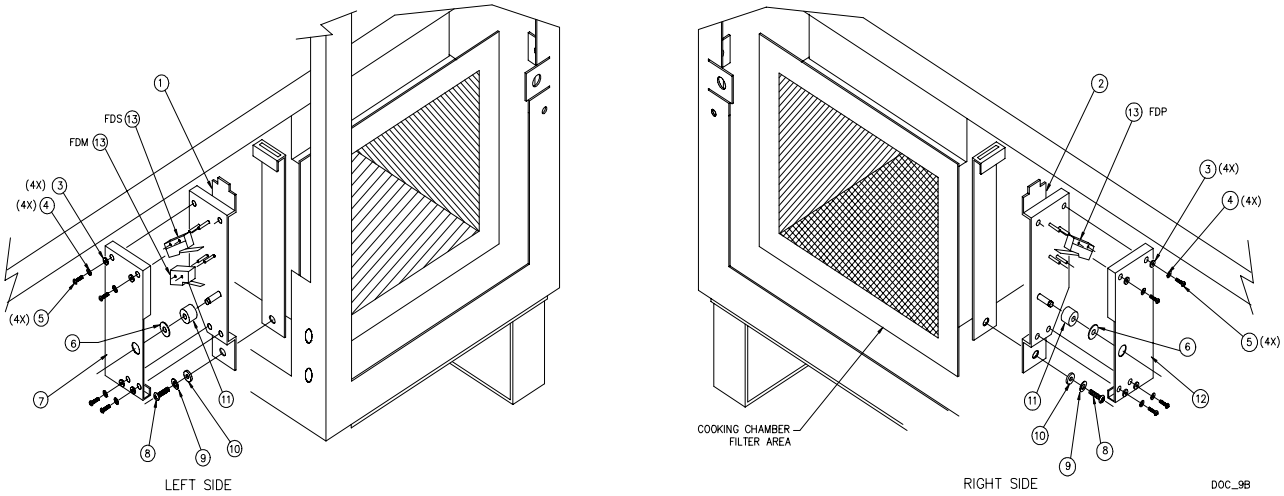
RH SHOWN

DOC_6

COOK DOOR LATCH/INTERLOCK SWITCH ASSEMBLY

ITEM	PART NO.	DESCRIPTION
1	700-0088	ROD, U-SUPPORT
2	101010	1/2-13 NUT, JAM
3	100940	1/2-13 NUT, HEX
4	102015	MICROSWITCH, MONITOR, (CDM)
5	102015	MICROSWITCH, INTERLOCK, (CDP)/(CDS)
6	700-0563-1	SWITCH BRACKET, RIGHT
7	700-0563-2	SWITCH BRACKET, LEFT
8	101880	DIE SPRING, 1" FREE LENGTH
9	102253	1/2 WASHER, FLAT, SMALL PATTERN
10	700-0567	BEARING, FLANGE, MODIFIED
11	101550	SCREW, PPH, SS, #4-40 X .625
12	102370	WASHER, LOCK, SPLIT, SS, #4
13	102240	WASHER, FLAT, SMALL PATTERN, SS, #4

7.0 FILTER DOOR SWITCH LOCATION / ASSEMBLY



FILTER DOOR LATCH/INTERLOCK SWITCH ASSEMBLIES

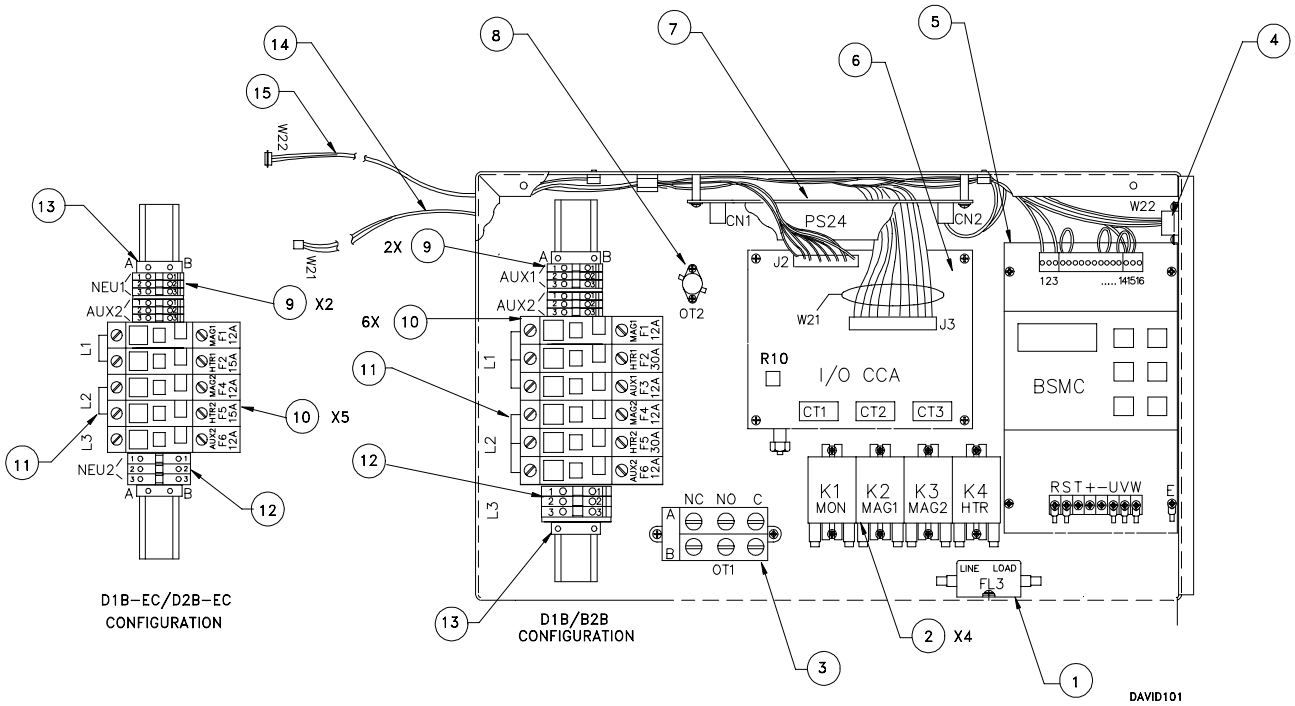
ITEM	PART NO.	DESCRIPTION
1	700-0529-2	SWITCH PLATE, LEFT
2	700-0529-1	SWITCH PLATE, RIGHT
3	102160	#4 WASHER, FLAT
4	102370	#4 WASHER, LOCK, SPLIT
5	101555	4-40 X .75 LG. SCREW, PPH, SS
6	102255	3/8 WASHER, FLAT, SMALL PATTERN
7	700-0530-2	STIFFENER PLATE, FILTER DOOR, LEFT
8	101790	10-32 X .75 LG. SCREW, PPH, SS
9	102350	#10 WASHER, LOCK, SPLIT
10	102140	#10 WASHER, FLAT
11	100400	BEARING
12	700-0530-1	STIFFENER PLATE, FILTER DOOR RIGHT
13	102015	MICROSWITCH

NOTE: SHOWN WITH FILTER DOOR, 700-0615, REMOVED.

8.0 CONTROL

CAUTION: When a procedure calls for replacing a Circuit Card Assemble, (CCA), or the EPROM IC, the power switch must be OFF or permanent damage may result.

8.1 Electrical Enclosure Assembly



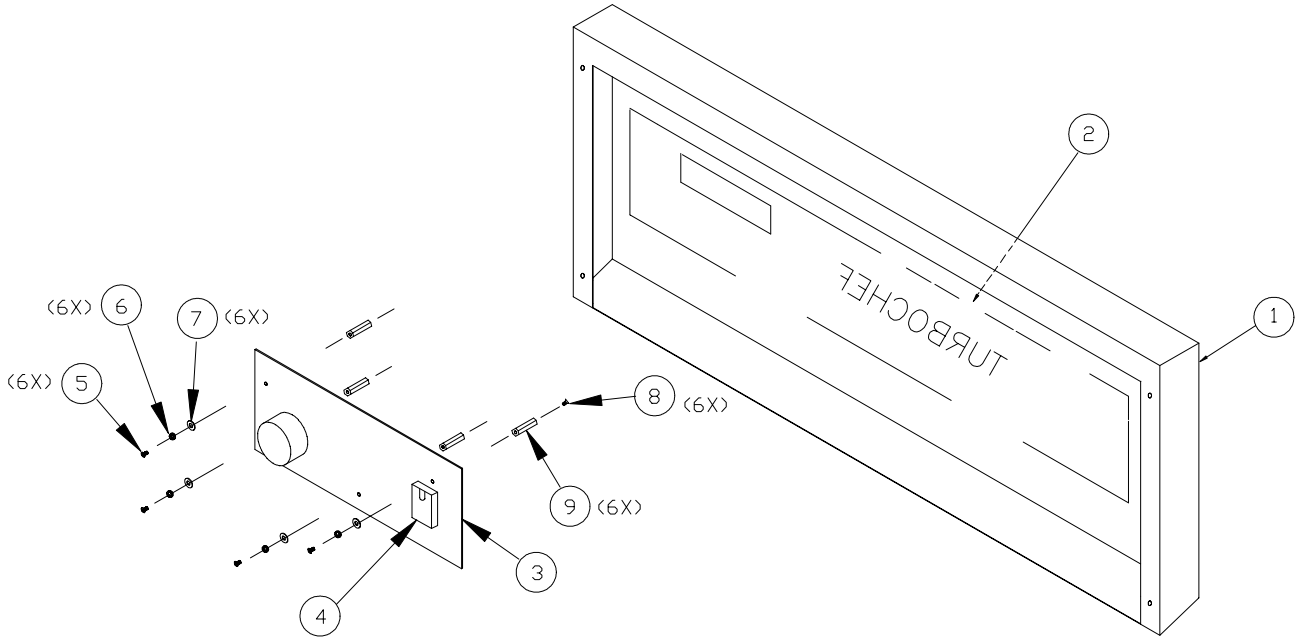
ELECTRICAL ENCLOSURE ASSEMBLY

ITEM	PART NO.	DESCRIPTION
1	100540	FILTER, EMI
2	101268	RELAY, POWER
3	101017	SWITCH, THERMAL LIMIT, 600°F, OT1
4	700-0399	CABLE, EXTENSION, RS-232
5	100440	CONTROLLER, MOTOR, SP 500
6	100660	I/O CIRCUIT CARD ASSY, D1/D1A/D2 SERIES
	80849	I/0 CIRCUIT CARD ASSY, D1B/D2B SERIES
7	101205	POWER SUPPLY
8	102085	THERMOSTAT 120°F, OT2
9	100490	DISTRIBUTION BLOCK, MB4/6.L3
10	100590	FUSE HOLDER, 30A, MB10/22SF
11	100710	JUMPER BAR, 10 POLE
12	100491	DISTRIBUTION BLOCK, MB6/8.L3
13	100470	END STOP, DIN RAIL
--	100595	FUSE 12A, UL CLASS CC (KLKR-12)
--	100601	FUSE 15A, UL CLASS CC (KLKR-15)
--	100615	FUSE 30A, UL CLASS CC (KLKR-30)
--	100635	FUSE 5A, UL CLASS CC (KLKR-5)
14	700-0407-3	RIBBON CABLE, 50 COND X 36”, W21
15	700-0399-1	RIBBON CABLE, 9 COND X 44”, W22

8.2 Electrical Enclosure Diagnostic Message

SELF TEST	WHILE COOKING	CAUSE	CORRECTIVE ACTION
	EC Temp ___ °F	Electrical Enclosure Temperature above 140°F	1. Check oven air filter. 2. Check cooling fan operation. 3. Checking cooling air pathways.

8.3 Display and Keypad Assembly



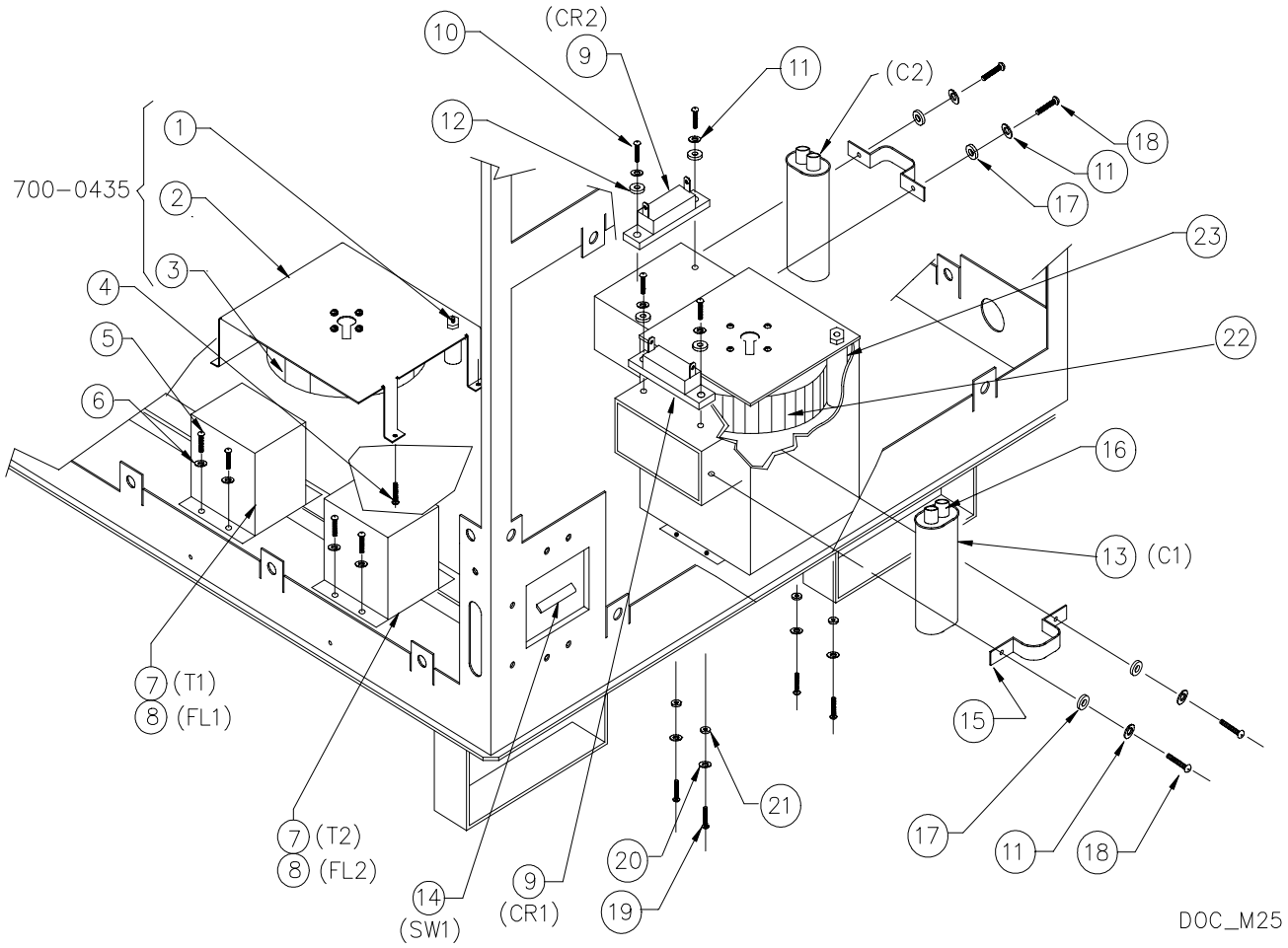
D□C_M12

DISPLAY AND KEYPAD ASSEMBLY

ITEM	PART NO.	DESCRIPTION
1	700-0269	CONTROLLER, ENCLOSURE
2	700-0328	KEYPAD
3	100430	CONTROLLER CIRCUIT CARD ASSY, D1/D1A/D2 SERIES
	80846	CONTROLLER CIRCUIT CARD ASSY, D1B/D2B SERIES
4 **	700-0650	IC, EPROM, SOFTWARE NOTE: PLEASE SPECIFY SOFTWARE VERSION WHEN ORDERING
5	101520	4-40 X .25 LG. SCREW, PPH, SS
6	102370	#4 WASHER, SPLIT LOCK
7	102240	#4 WASHER, FLAT, SMALL PATTERN
8	101420	4-40 X .25 LG. SCREW, PFH, 100°
9	101920	STANDOFF, FEM/FEM HEX ALUM.

**** NOTE:** WHEN REPLACING THE EPROM IC, ITEM 4, MAKE SURE POWER IS OFF, THE IC IS NOT INSERTED UPSIDE DOWN, AND ALL PINS INSERT INTO THE MATING CONNECTOR ON THE BOARD CORRECTLY. IF THESE PRECAUTIONS ARE NOT FOLLOWED, PERMANENT DAMAGE TO THE IC MAY RESULT.

9.0 MAGNETRON FAN/COOLING FAN/TRANSFORMERS/DIODES/ CAPACITORS.



FLOOR MOUNTED ELECTRICAL PARTS

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	100240	CAPACITOR, RUN, 2 uF, 400 V	13 **	100200	CAPACITOR, HV, 1.05 uF, 2500 V (US)
2	700-0431	BRACKET, ROTARY FAN		100205	CAPACITOR, HV, 1.2 uF, 2500 V (EC)
3	100090	BLOWER, COOLING, 240 VAC, 50/60 HZ (US)	14	101015	CIRCUIT BRKR/SWITCH, 40 AMP
4	101436	SCREW, PFH , 82°, SS, 10-32 X .38 (EC)		101016	CIRCUIT BRKR/SWITCH, 25 AMP
5	101747	SCREW, SKT. HD, SS, 8-32 X .500	15	100130	BRACKET, CAPACITOR
6	102275	WASHER, LOCK, EXT. TOOTH, SS, #8	16	100220	TERMINAL CAP, CAPACITOR
7	102095	TRANSFORMER, HV, 60 HZ (US)	17	102170	WASHER, FLAT, SS, # 6
	102096	TRANSFORMER, HV, 50 HZ (EC)	18	101590	SCREW, PPH, SS, 6-32 X .38
8	100540	FILTER, EMI (UNDER TRANSFORMERS)	19	101630	SCREW, PPH, SS, 8-32 X .50
9	100400	DIODE, HIGH VOLTAGE, 15,000 V	20	102390	WASHER, SPLIT LOCK, SS, #8
10	101570	SCREW, PPH, SS, 6-32 X .500	21	102180	WASHER, FLAT, SS, #8
11	102380	WASHER, SPLIT, LOCK, SS, #6	22	100080	BLOWER, MAG., 240 VAC, 50/60 HZ
12	102250	WASHER, FLAT, SMALL PATTERN, #6	23	102687	CAPACITOR, RUN, 4.0 uF, 400V

**** NOTE:** MAGNETRON CAPACITORS, C1 & C2, ARE LOCATED ON TOP OF MAGNETRON COOLING FAN ASSEMBLY ON LATER OVENS.

10.0 WHERE AND HOW TO OBTAIN PARTS

10.1 How to Order Parts

Copy the following requisition form and Fax with your purchase order.

PURCHASE REQUISITION

US Address
TurboChef, Inc.
10500 Metric Drive, Suite 128
Dallas, Texas 75243
U.S.A.

Tel: (214) 341-9471
Fax: (214) 340-8477

UK Address
Sears Engineering Services
Unit D8, Ivinghoe Business Centre
Blackburn Road, Townsend Industrial Estate
Houghton Regis, Beds LU5 5BQ
England, United Kingdom
Tel: 1-582-666-250
Fax: 1-582-662-362

ATTN: CUSTOMER SERVICE / PARTS DEPARTMENT
PLEASE SHIP THE FOLLOWING PARTS TO THE ADDRESS SHOWN BELOW:

ITM NO.	PART NO.	DESCRIPTION	MODEL NO.	SERIAL NO.	QUANTITY

SHIP TO: CO. NAME_____
ADDRESS_____
CITY_____STATE_____ZIP_____
PHONE#_____FAX#_____

SOLD TO: CO. NAME_____
ADDRESS_____
CITY_____STATE_____ZIP_____
PHONE#_____FAX#_____

NOTES:
1. IN ORDER TO OBTAIN THE CORRECT PARTS, IT IS IMPORTANT TO INCLUDE THE MODEL AND SERIAL NUMBER OF THE OVEN (REFER TO 1.1 FOR HELP).
2. WE WILL SHIP PREPAID AND INVOICE YOU FOR THE CHARGES.
3. TURBO*CHEF* WILL ADD APPLICABLE SHIPPING CHARGES FOR ALL PURCHASE PARTS.
4. PLEASE CIRCLE DESIRED METHOD OF SHIPMENT:
   - NEXT DAY- U.P.S. / FEDEX / DHL
   - 2ND DAY – U.P.S.
   - 3RD DAY – U.P.S.
   - U.P.S. GROUND

10.2 Returning Critical Components

All critical components such as the magnetrons, transformers, circuit boards, and motor assemblies should be sent back to the factory. These parts are normally analyzed for failures and the information used to help improve oven reliability.

Note: Never send a defective transformer and a circuit board back in the same box. The heavy transformer will break or otherwise damage the circuit board.

10.3 Substitution of Parts

We recommend that parts be replaced with original equipment manufacturers parts. In case you don't know the part number of the component, it may be ordered from TurboChef, Inc. by giving the model and serial number of the oven and a brief description of the part. If there is any question about substitute parts, feel free to contact the Customer Service Toll Free Number given on the front cover for assistance.

11.0 CASE HISTORY

11.1 Common Door Related Problems

SYMPTOM

OVEN DISPLAYS COOK DOOR OPEN OR FILTER DOOR OPEN WHEN COOK DOOR AND FILTER DOOR ARE CLOSED.

CORRECTIVE ACTION

1. REQUIRES COOK DOOR OR FILTER DOOR ALIGNMENT (TOO MUCH PLAY).
2. DOOR HANDLE LATCH MECHANISM NOT FUNCTIONING PROPERLY.
3. DEFECTIVE DOOR HANDLE.
4. DEFECTIVE MICROSWITCH OR NEED PROPER ALIGNMENT (CHECK ALL INTERLOCK SWITCHES IN THE OVEN).

SYMPTOM

OVEN DOOR DIFFICULT TO OPEN.

CORRECTIVE ACTION

1. VERIFY OVEN DOOR RING DOES NOT INTERFERE WITH SCREEN BASKET INSIDE THE OVEN.
2. VERIFY DOOR SLIDE RAIL HARDWARE IS TIGHT AND BEARINGS ARE ROLLING FREELY.
3. VERIFY BEARING ASSEMBLIES ARE NOT EXCESSIVELY WORN OR DAMAGED.

SYMPTOM

OVEN DOOR DIFFICULT TO OPEN AND CLOSE.

CORRECTIVE ACTION

1. VERIFY MOVABLE WALL IS NOT LOOSE AND IS CORRECTLY ADJUSTED.
2. VERIFY COOKING RING IS NOT LOOSE.
3. VISUALLY INSPECT SLIDE BEARING ASSEMBLIES. IF BEARING ASSEMBLIES ARE DIRTY, CLEAN AND REINSTALL. IF SPOOLS ARE DEFECTIVE, REPLACE WITH NEW SPOOLS.
4. VERIFY ROD ASSEMBLIES ARE NOT LOOSE OR MISADJUSTED.
5. IF DOOR HANDLE IS NOT CLOSING PROPERLY, REMOVE DOOR COVER AND INSURE DOOR SPRINGS ARE NOT BROKEN.
6. IF DOOR DOES NOT CLOSE COMPLETELY:
   A. REMOVE DOOR COVER AND INSURE THAT THE THREE CENTER BOLTS AND INTERNAL ACORN NUTS ARE TIGHT. IF LOOSE THE DOOR MUST BE READJUSTED TO THE MATING FLANGE ON THE OVEN.
   B. CHECK DOOR BOTTOM COVER HARDWARE FOR TIGHTNESS.
   C. ADJUST DOOR LATCH MECHANISM.
   D. CHECK MOVEABLE WALL TO INSURE THAT IT HAS NOT SLID BACK CAUSING INTERFERENCE.

SYMPTOM

OVEN DOOR DETACHES FROM OVEN.

CORRECTIVE ACTION

1. VERIFY DOOR SLIDE RAIL HARDWARE IS TIGHT AND DOOR STOPS ARE WORKING PROPERLY.
2. REPLACE DOOR STOPS.

11.2 Miscellaneous Problems

SYMPTOM

NO DISPLAY.

CORRECTIVE ACTION

1. CHECK AUXILIARY FUSES.
2. POWER SUPPLY 240 VAC INPUT AND 24 VDC OUTPUT.
3. CHECK FOR A POSSIBLE SHORT IN THE CIRCUIT FOR THE POWER SUPPLY (CHASSIS IS 24 VDC GROUND).
4. CHECK FOR LOOSE CONNECTORS OR WIRES.
5. CHECK FOR PROPER INSTALLATION OF SOFTWARE (EPROM).

SYMPTOM

KEEPS BLOWING MAGNETRON FUSES.

CORRECTIVE ACTION

1. CHECK FOR CORRECT FUSE TYPE.
2. CHECK INTERLOCK SWITCH OPERATION.
3. CHECK FOR PROPER DOOR ALIGNMENT OR FILTER DOOR.
4. CHECK FOR POSSIBLE SHORTED MAGNETRON CAPACITOR, DIODE OR MAGNETRON TUBE.
5. SHORTED MONITOR RELAY OR MAGNETRON POWER RELAY (IF BLOWING BOTH FUSES).

SYMPTOM

MAGNETRON FAN NOT OPERATING PROPERLY.

CORRECTIVE ACTION

1. CHECK FOR ANY LOOSE WIRES IN THE CIRCUIT.
2. CHECK FOR CONTINUITY AND VOLTAGE AT THE CONNECTOR.
3. CHECK PROPER CONNECTOR GOING TO MAG FAN MOTOR.
4. DEFECTIVE MOTOR OR CAPACITOR.

SYMPTOM

STIRRER MOTOR DOES NOT ROTATE (RF LEVEL DOES NOT CHANGE WHEN MAGNETRONS ARE ON).

CORRECTIVE ACTION

1. DEFECTIVE STIRRER MOTOR.
2. CHECK FOR PROPER OPERATION OF THE MAGNETRON RELAY.
3. CHECK FOR CONTINUITY AND VOLTAGE AT THE STIRRER MOTOR CONNECTOR (REFER TO PROPER SCHEMATIC).

SYMPTOM

DISPLAYED TEMPERATURES HAVE ERRATIC FLUCTUATIONS.

CORRECTIVE ACTION

1. CHECK FOR ANY LOOSE WIRES ON THERMOCOUPLE CIRCUIT.
2. CHECK FOR RF LEAKAGE AT THE MAGNETRON CAVITY (RF ENERGY MIGHT BE REFLECTING BACK TO THE I/O BOARD DISTURBING PROPER FUNCTIONING OF THE AMPLIFIER).
3. CHECK FOR PROPER INSTALLATION OF THE THERMOCOUPLES (REFER TO SECTION 4).

SYMPTOM

OVEN TURNS ON/OFF (RESETTING IT SELF AND GOING INTO THE SELF TEST).

CORRECTIVE ACTION

1. CHECK I/O AND CONTROL (DISPLAY) CIRCUIT CARD ASSEMBLY RIBBON CABLES.
2. CHECK POWER SUPPLY INPUT & OUTPUT.
3. CHECK ALL CONNECTIONS AT THE INTERLOCK SWITCHES FOR ANY ERRATIC BEHAVIOR (SUCH AS LOOSE WIRES OR OPEN SWITCHES).
4. CHECK INCOMING POWER TO THE OVEN.

12.0 DIAGNOSTIC INFORMATION

The following information is provided to aid in location of faults in the oven.

Status LED definitions (Refer to Status LED Layout)

LED	Name	Description
1	CDP	Cook Door Primary interlock + Filter Door Primary interlock switches closed.
2	CDS	Cook Door Secondary interlock + Filter Door Secondary interlock switches closed.
3	CDM	Cook Door Monitor interlock + Filter Door Monitor interlock switches closed.
4	FDP	Filter Door Primary interlock switch closed.
5	FDS	Filter Door Secondary interlock switch closed.
6.	FDM	Filter Door Monitor interlock switch closed.
7	BLR	Blower Motor Controller on.
8	--	Not Used
9	--	Not Used
10	--	Not Used
11	HXR	Heat Exchanger Power Relay closed. (Not used on early “B” Version ovens.)
12	M1T	Magnetron 1 Temperature below maximum (212°F)(100°C). (“B” Version ovens only.)
13	M2T	Magnetron 2 Temperature below maximum (212°F)(100°C). (“B” Version ovens only.)
14	M1I	Magnetron 1 Current. Input to Magnetron 1 transformer above 7 amps.
15	M2I	Magnetron 2 Current. Input to Magnetron 2 transformer above 7 amps.
16	HXI	Heat Exchanger Current above 7 amps (In phase measured.)

Interlock and Monitor Switch Locations

Cook Door Primary Interlock (CDP)	Right side top
Cook Door Secondary Interlock (CDS)	Left side top
Cook Door Monitor (CDM)	Right side bottom
Filter Door Primary Interlock (FDP)	Right side top
Filter Door Secondary Interlock (FDS)	Left side top
Filter Door Monitor (FDM)	Left side bottom

Magnetron Circuit Parts Locations

T1	Right most transformer.
T2	Left most transformer.
MAG1	Right most magnetron.
MAG2	Rear magnetron.

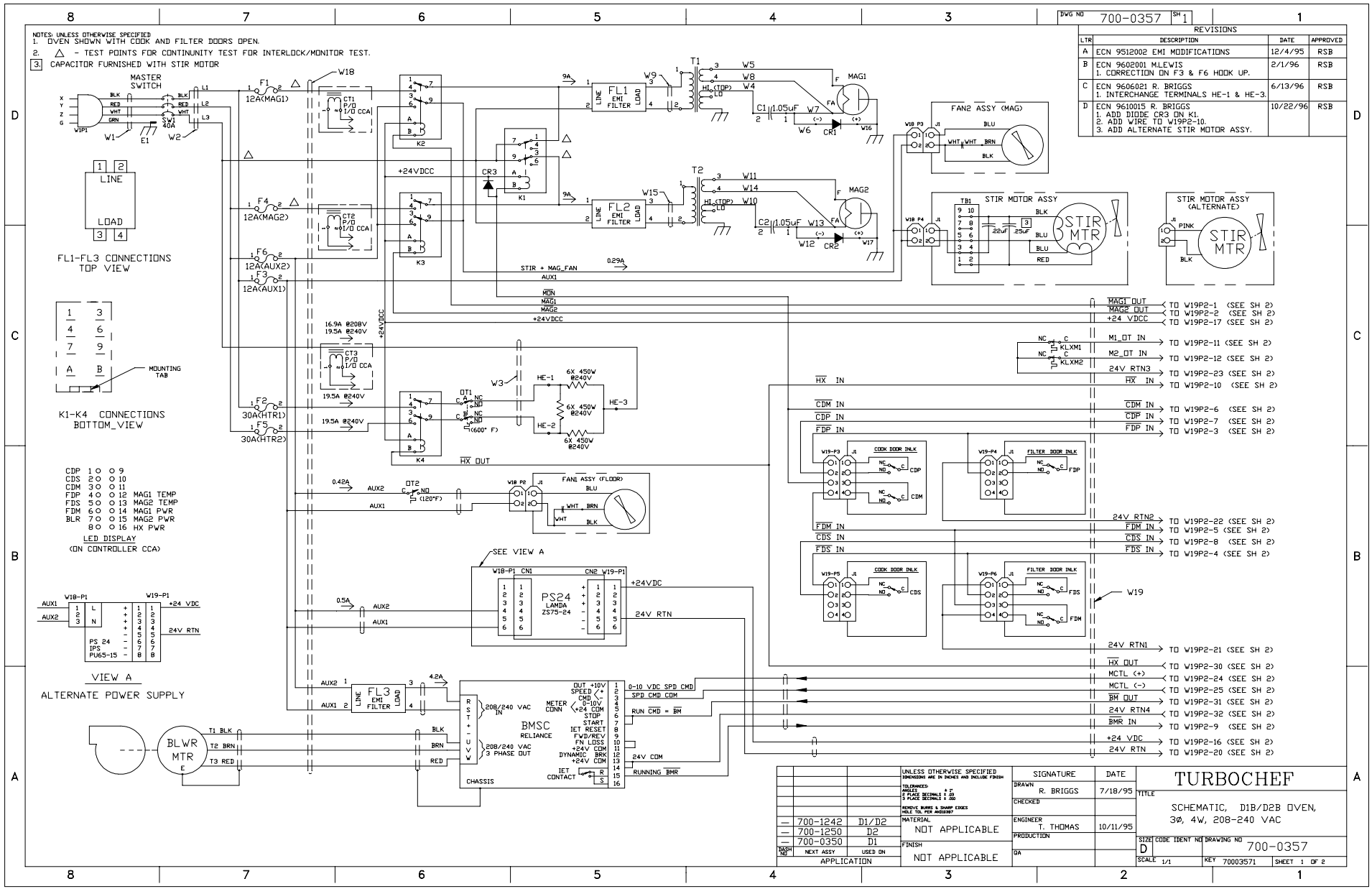
Notes on Thermocouple Troubleshooting

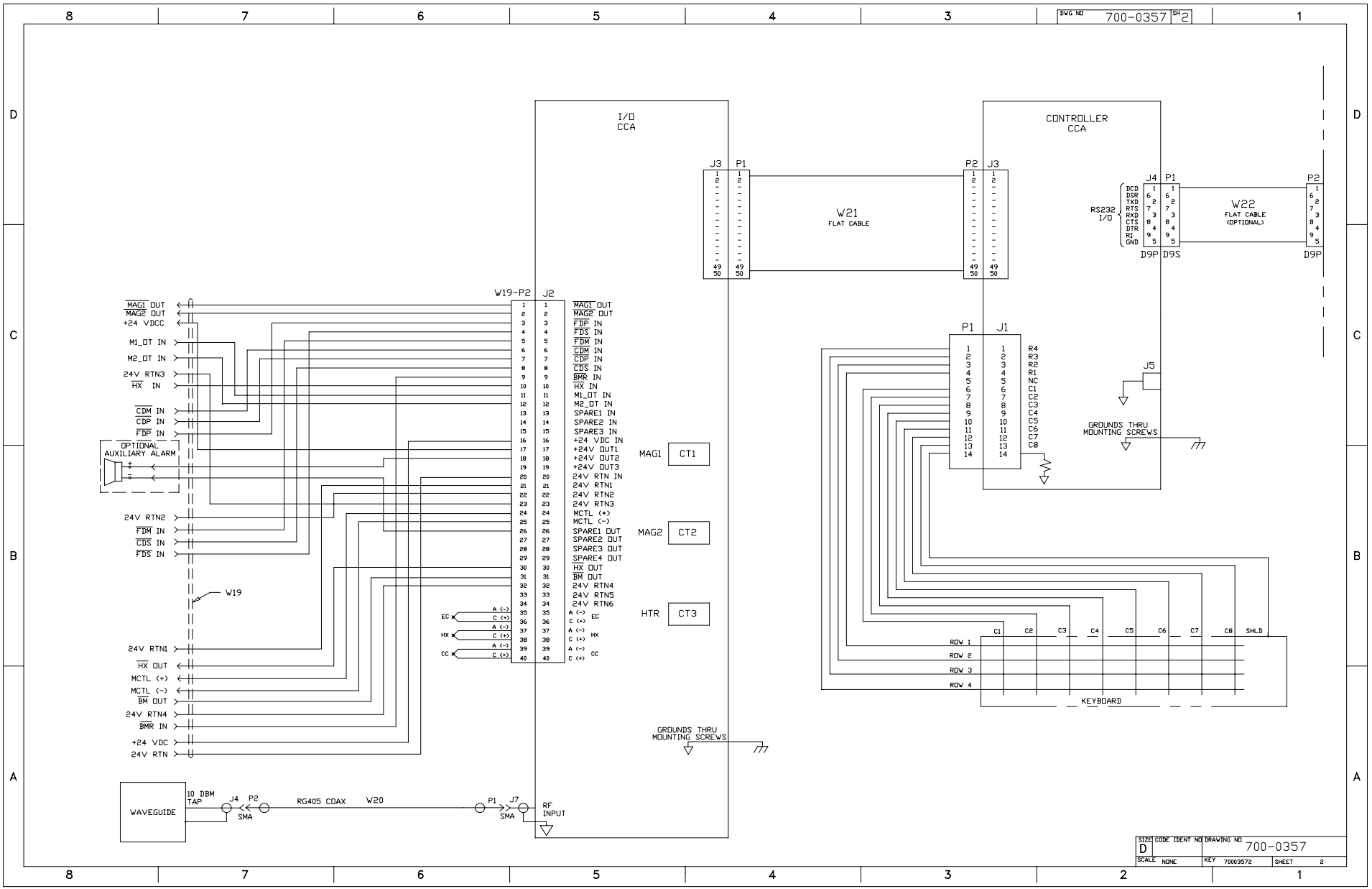
1. Display Reading 77°(25°C) is acceptable when oven is cold.
2. Display Reading 999°(999°C) indicates related thermocouple is open
3. Thermocouples can be tested by placing in boiling water and checking display for approximately 212°F(100°C).

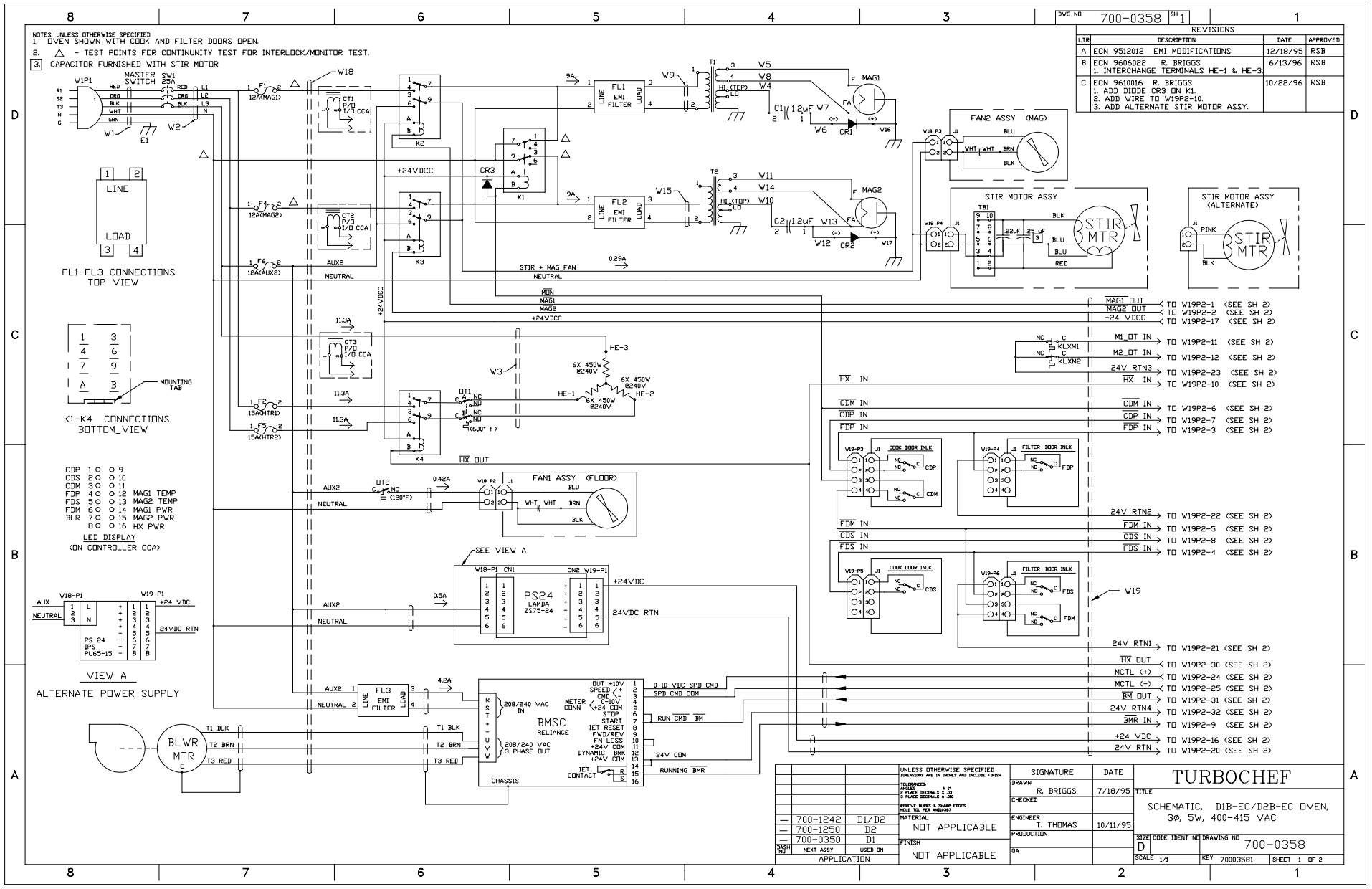
Electrical Schematics

The following electrical schematics are provided to aid in troubleshooting the various ovens. A schematic may also be found behind the control panel of the oven. The correct schematics for the various models are defined below:

Model	Schematic	Title
D1B/D2B	700-0357	Schematic, D1B/D2B Oven, 3Ø, 4W, 208-240 VAC
D1B-EC/D2B-EC	700-0358	Schematic, D1B-EC/D2B-EC Oven, 3Ø, 5W, 400-415 VAC
D1-EC/D2-EC	700-0398	Schematic, Oven, 3Ø, 5W, 400-415 VAC, 50 HZ
D1/D1A/D2	700-0425	Schematic, Oven, 3Ø, 4W, 208-240 VAC


DWG NO 700-0357 SH 1
REVISIONS
LTR | DESCRIPTION | DATE | APPROVED
A | ECN 9512002 EMI MODIFICATIONS | 12/4/95 | RSB
B | ECN 9602001 M.LEWIS 1. CORRECTION ON F3 & F6 HOOK UP. | 2/1/96 | RSB
C | ECN 9606021 R. BRIGGS 1. INTERCHANGE TERMINALS HE-1 & HE-3. | 6/13/96 | RSB
D | ECN 9610015 R. BRIGGS 1. ADD DIODE CR3 ON K1. 2. ADD WIRE TO W19P2-10. 3. ADD ALTERNATE STIR MOTOR ASSY. | 10/22/96 | RSB
NOTES: UNLESS OTHERWISE SPECIFIED
1. OVEN SHOWN WITH COOK AND FILTER DOORS OPEN.
2. △ - TEST POINTS FOR CONTINUNITY TEST FOR INTERLOCK/MONITOR TEST.
3. CAPACITOR FURNISHED WITH STIR MOTOR
MASTER SWITCH
FL1-FL3 CONNECTIONS TOP VIEW
K1-K4 CONNECTIONS BOTTOM_VIEW
MOUNTING TAB
CDP 1 O O 9
CDS 2 O O 10
CDM 3 O O 11
FDP 4 O O 12 MAG1 TEMP
FDS 5 O O 13 MAG2 TEMP
FDM 6 O O 14 MAG1 PWR
BLR 7 O O 15 MAG2 PWR
8 O O 16 HX PWR
LED DISPLAY (ON CONTROLLER CCA)
VIEW A
ALTERNATE POWER SUPPLY
PS 24 IPS PU65-15
PS24 LAMDA Z575-24
FAN2 ASSY (MAG)
FAN1 ASSY (FLOOR)
STIR MOTOR ASSY
STIR MOTOR ASSY (ALTERNATE)
BMSC RELIANCE
BLWR MTR
+24VDCC
STIR + MAG_FAN
MDN
MAG1
MAG2
HX OUT
HX IN
CDM IN
CDP IN
FDP IN
FDM IN
CDS IN
FDS IN
MAG1 OUT
MAG2 OUT
+24 VDCC
M1_OT IN
M2_OT IN
24V RTN3
24V RTN2
24V RTN1
MCTL (+)
MCTL (-)
BM OUT
24V RTN4
BMR IN
+24 VDC
24V RTN
0-10 VDC SPD CMD
SPD CMD COM
RUN CMD = BM
24V COM
RUNNING BMR
TO W19P2-1 (SEE SH 2)
TO W19P2-2 (SEE SH 2)
TO W19P2-17 (SEE SH 2)
TO W19P2-11 (SEE SH 2)
TO W19P2-12 (SEE SH 2)
TO W19P2-23 (SEE SH 2)
TO W19P2-10 (SEE SH 2)
TO W19P2-6 (SEE SH 2)
TO W19P2-7 (SEE SH 2)
TO W19P2-3 (SEE SH 2)
TO W19P2-22 (SEE SH 2)
TO W19P2-5 (SEE SH 2)
TO W19P2-8 (SEE SH 2)
TO W19P2-4 (SEE SH 2)
TO W19P2-21 (SEE SH 2)
TO W19P2-30 (SEE SH 2)
TO W19P2-24 (SEE SH 2)
TO W19P2-25 (SEE SH 2)
TO W19P2-31 (SEE SH 2)
TO W19P2-32 (SEE SH 2)
TO W19P2-9 (SEE SH 2)
TO W19P2-16 (SEE SH 2)
TO W19P2-20 (SEE SH 2)
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH
TOLERANCES: ANGLES ± 2° 2 PLACE DECIMALS ± .02 3 PLACE DECIMALS ± .010
REMOVE BURRS & SHARP EDGES MAX TOL PER ANSI/SME
MATERIAL NOT APPLICABLE
FINISH NOT APPLICABLE
DASH NO | NEXT ASSY | USED ON APPLICATION
— 700-1242 D1/D2
— 700-1250 D2
— 700-0350 D1
SIGNATURE | DATE
DRAWN R. BRIGGS 7/18/95
CHECKED
ENGINEER T. THOMAS 10/11/95
PRODUCTION
QA
TURBOCHEF
TITLE SCHEMATIC, D1B/D2B OVEN, 3Ø, 4W, 208-240 VAC
SIZE D CODE IDENT NO DRAWING NO 700-0357
SCALE 1/1 KEY 70003571 SHEET 1 OF 2


DWG NO 700-0357 SH 2
I/O CCA
CONTROLLER CCA
W21 FLAT CABLE
W22 FLAT CABLE (OPTIONAL)
RS232 I/O
D9P
D9S
W19-P2
J2
MAG1 OUT
MAG2 OUT
+24 VDCC
M1_OT IN
M2_OT IN
24V RTN3
HX IN
CDM IN
CDP IN
FDP IN
OPTIONAL AUXILIARY ALARM
24V RTN2
FDM IN
CDS IN
FDS IN
W19
24V RTN1
HX OUT
MCTL (+)
MCTL (-)
BM OUT
24V RTN4
BMR IN
+24 VDC
24V RTN
MAG1 CT1
MAG2 CT2
HTR CT3
SPARE1 OUT
SPARE2 OUT
SPARE3 OUT
SPARE4 OUT
24V RTN4
24V RTN5
24V RTN6
EC
HX
CC
GROUNDS THRU MOUNTING SCREWS
KEYBOARD
ROW 1
ROW 2
ROW 3
ROW 4
C1 C2 C3 C4 C5 C6 C7 C8 SHLD
WAVEGUIDE
10 DBM TAP
RG405 COAX
W20
SMA
RF INPUT
SIZE D
DRAWING NO 700-0357
SCALE NONE
SHEET 2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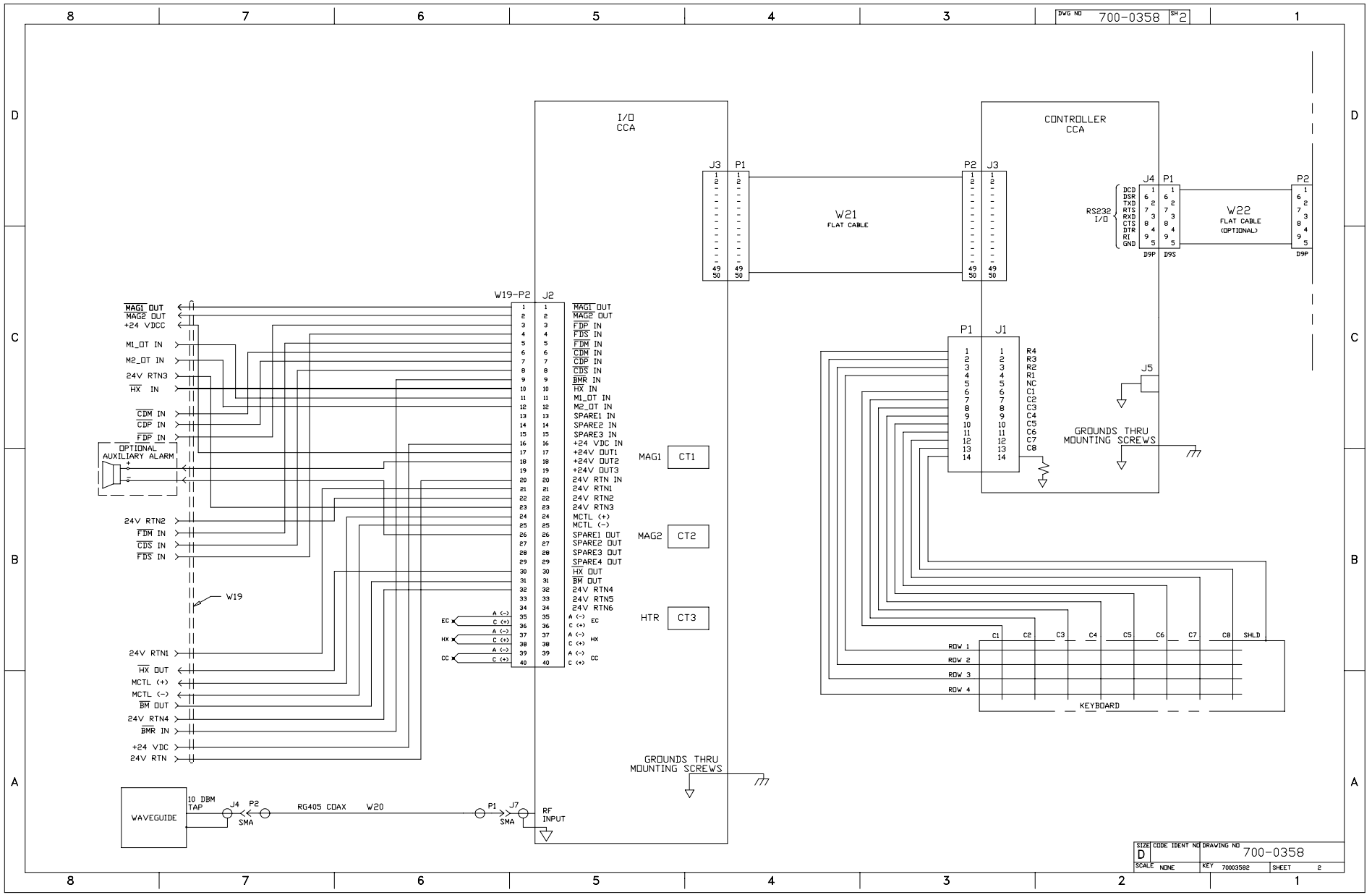
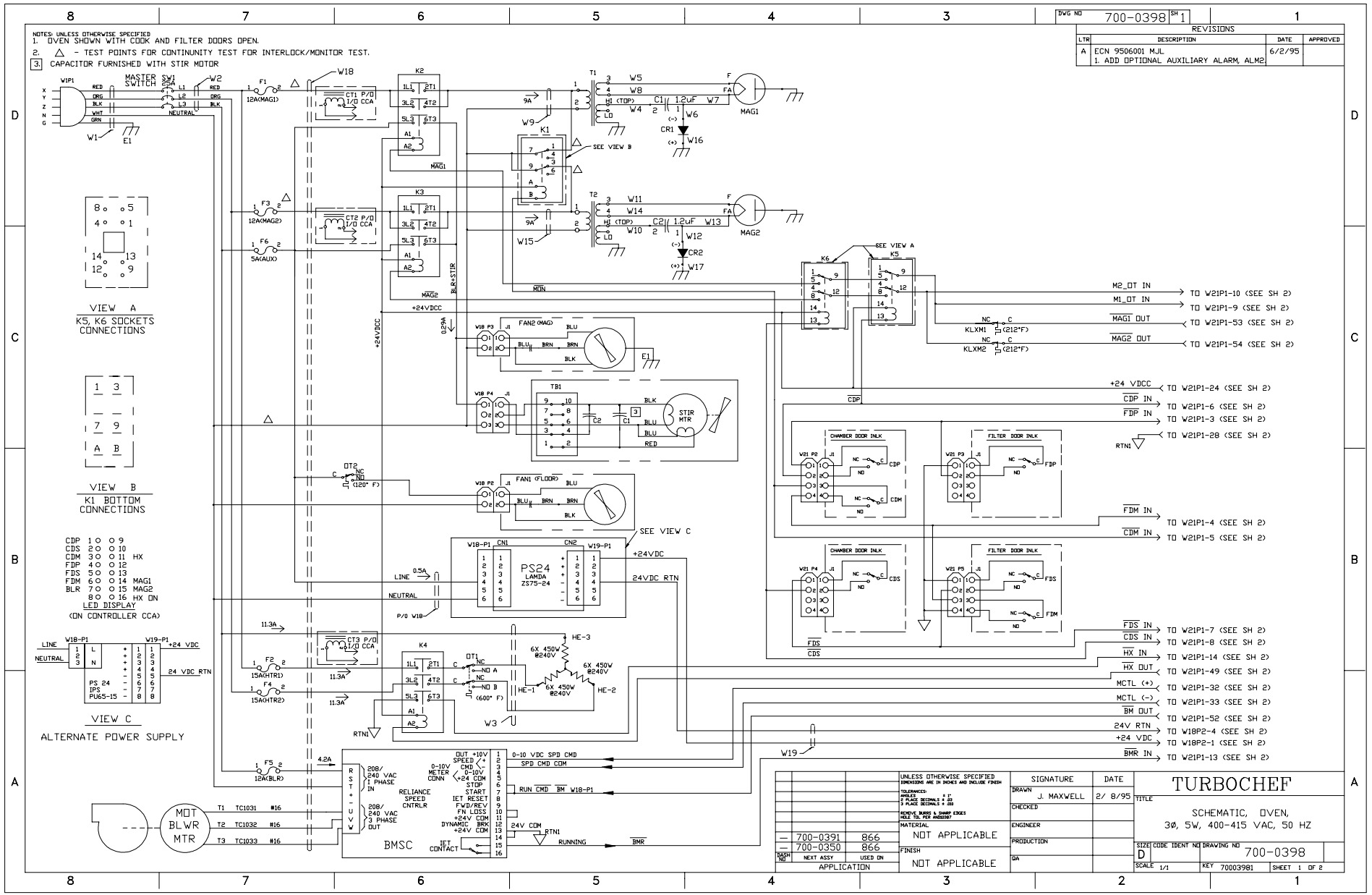
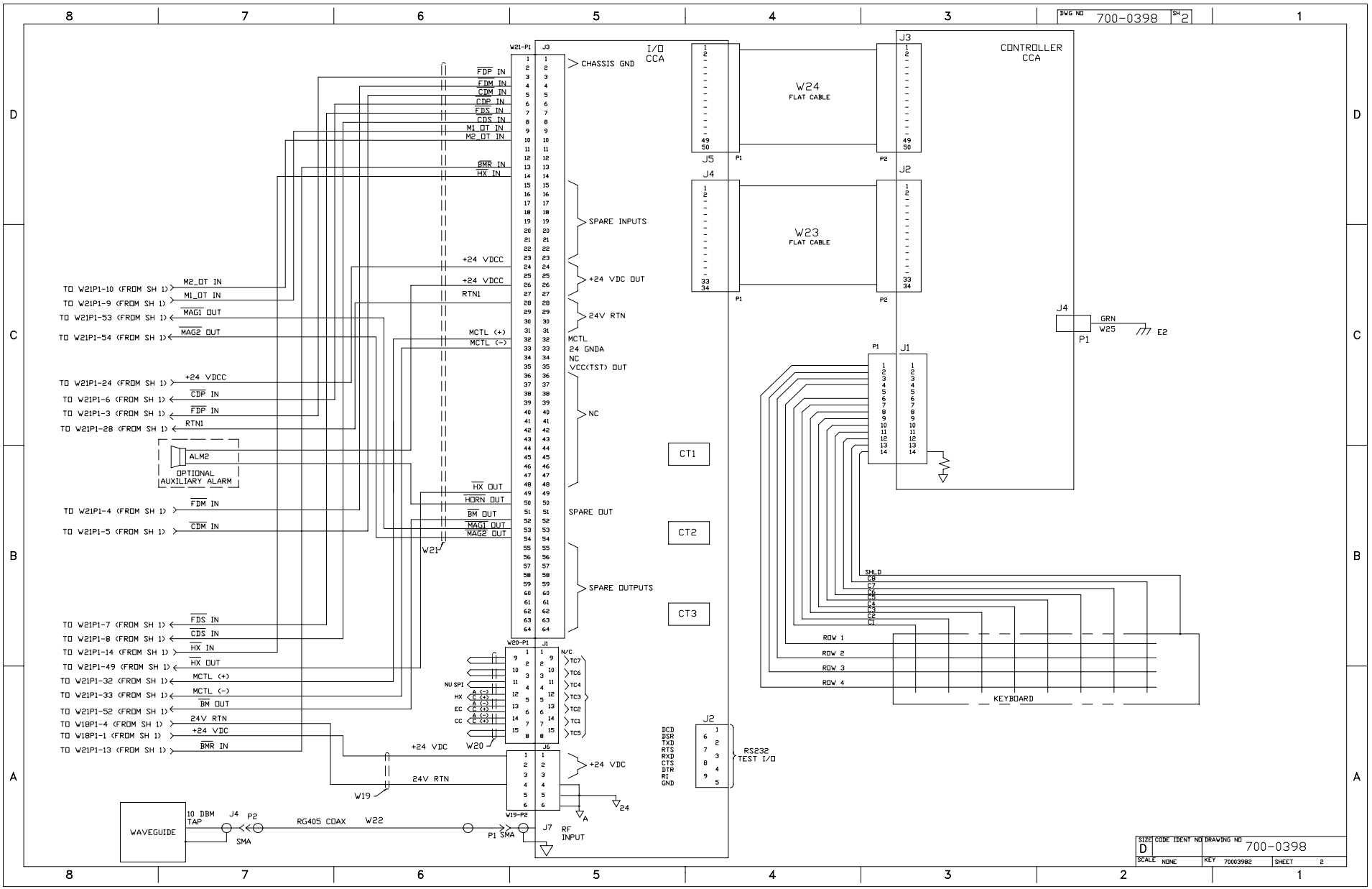
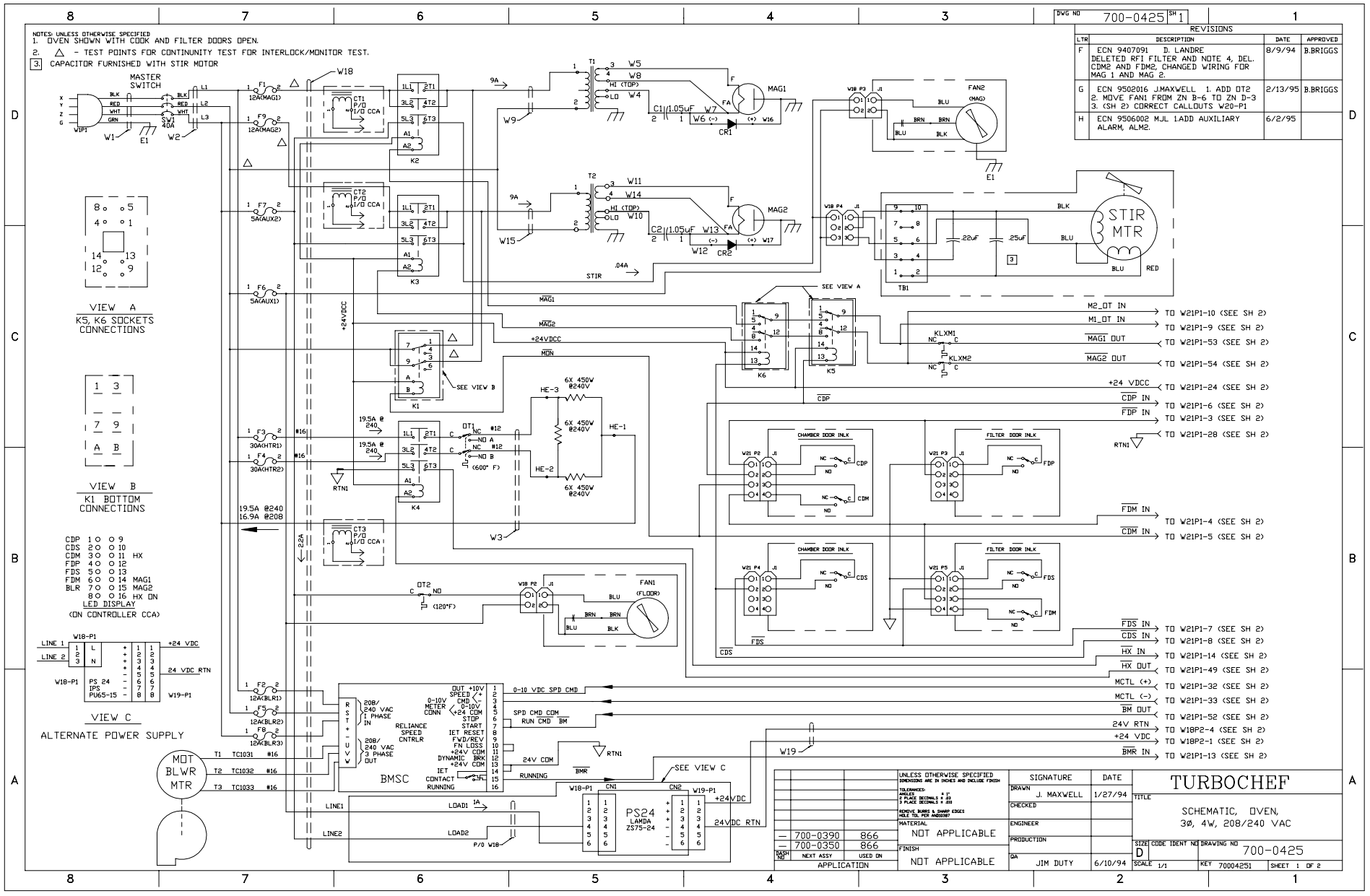
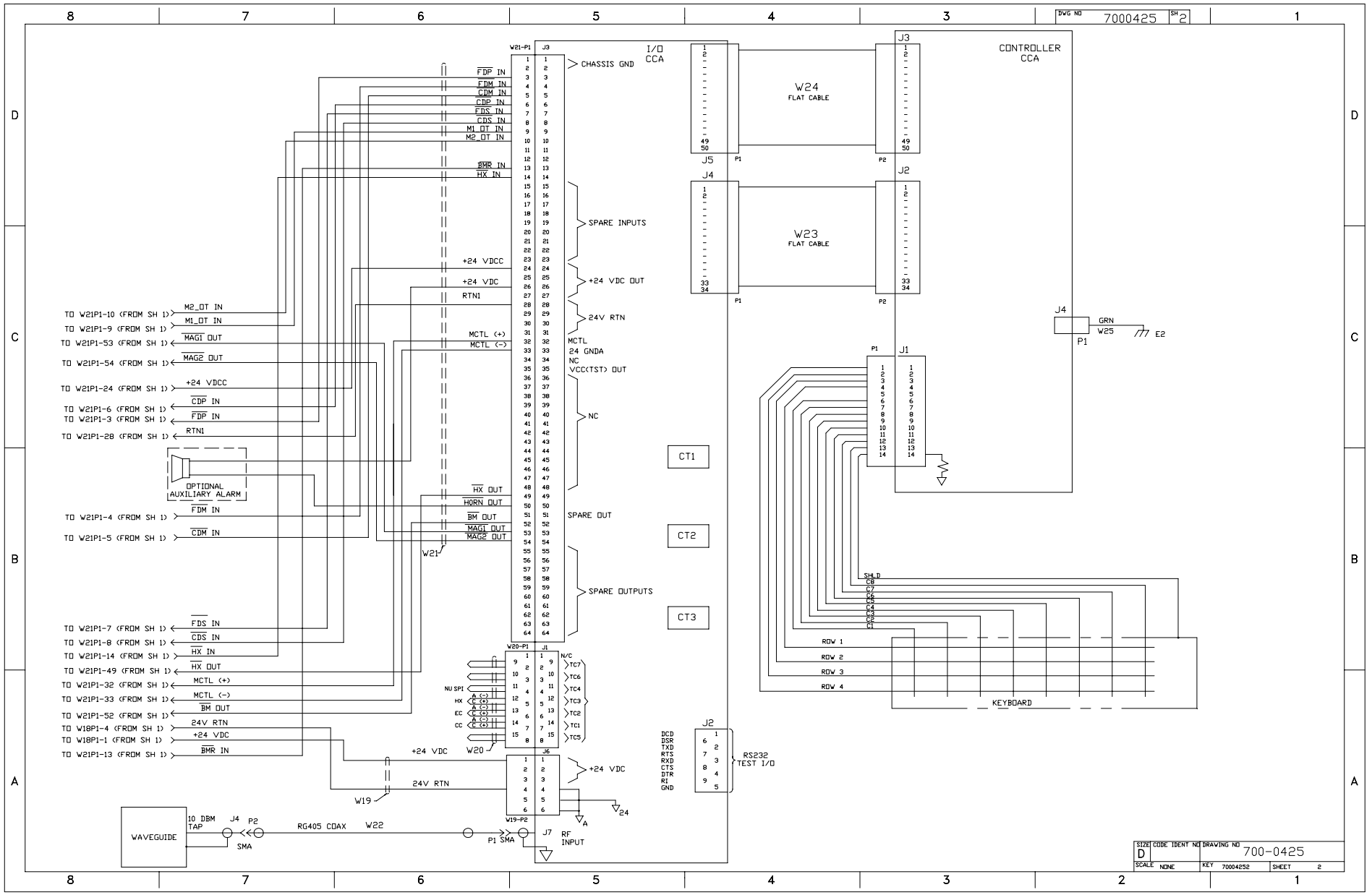
REVISIONS
LTR | DESCRIPTION | DATE | APPROVED
A | ECN 9512012 EMI MODIFICATIONS | 12/18/95 | RSB
B | ECN 9606022 R. BRIGGS 1. INTERCHANGE TERMINALS HE-1 & HE-3. | 6/13/96 | RSB
C | ECN 9610016 R. BRIGGS 1. ADD DIODE CR3 ON K1. 2. ADD WIRE TO W19P2-10. 3. ADD ALTERNATE STIR MOTOR ASSY. | 10/22/96 | RSB
NOTES: UNLESS OTHERWISE SPECIFIED
1. OVEN SHOWN WITH COOK AND FILTER DOORS OPEN.
2. △ - TEST POINTS FOR CONTINUNITY TEST FOR INTERLOCK/MONITOR TEST.
3. CAPACITOR FURNISHED WITH STIR MOTOR
MASTER SW1 SWITCH 25A
FAN2 ASSY (MAG)
STIR MOTOR ASSY
STIR MOTOR ASSY (ALTERNATE)
FL1-FL3 CONNECTIONS TOP VIEW
K1-K4 CONNECTIONS BOTTOM_VIEW
LED DISPLAY (ON CONTROLLER CCA)
CDP 1 O O 9
CDS 2 O O 10
CDM 3 O O 11
FDP 4 O O 12 MAG1 TEMP
FDS 5 O O 13 MAG2 TEMP
FDM 6 O O 14 MAG1 PWR
BLR 7 O O 15 MAG2 PWR
8 O O 16 HX PWR
VIEW A
ALTERNATE POWER SUPPLY
FAN1 ASSY (FLOOR)
BMSC RELIANCE
PS24 LAMDA ZS75-24
BLWR MTR
MAG1 OUT TO W19P2-1 (SEE SH 2)
MAG2 OUT TO W19P2-2 (SEE SH 2)
+24 VDCC TO W19P2-17 (SEE SH 2)
M1_OT IN TO W19P2-11 (SEE SH 2)
M2_OT IN TO W19P2-12 (SEE SH 2)
24V_RTN3 TO W19P2-23 (SEE SH 2)
HX IN TO W19P2-10 (SEE SH 2)
CDM IN TO W19P2-6 (SEE SH 2)
CDP IN TO W19P2-7 (SEE SH 2)
FDP IN TO W19P2-3 (SEE SH 2)
24V_RTN2 TO W19P2-22 (SEE SH 2)
FDM IN TO W19P2-5 (SEE SH 2)
CDS IN TO W19P2-8 (SEE SH 2)
FDS IN TO W19P2-4 (SEE SH 2)
24V_RTN1 TO W19P2-21 (SEE SH 2)
HX OUT TO W19P2-30 (SEE SH 2)
MCTL (+) TO W19P2-24 (SEE SH 2)
MCTL (-) TO W19P2-25 (SEE SH 2)
BM OUT TO W19P2-31 (SEE SH 2)
24V_RTN4 TO W19P2-32 (SEE SH 2)
BMR IN TO W19P2-9 (SEE SH 2)
+24 VDC TO W19P2-16 (SEE SH 2)
24V RTN TO W19P2-20 (SEE SH 2)
0-10 VDC SPD CMD
SPD CMD COM
RUN CMD BM
24V COM
RUNNING BMR
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH
TOLERANCES: ANGLES ± 2° 3 PLACE DECIMALS ± .010 2 PLACE DECIMALS ± .030
REMOVE BURRS & SHARP EDGES HOLE TOL PER ANSI B18.8.1
MATERIAL NOT APPLICABLE
FINISH NOT APPLICABLE
SIGNATURE | DATE
DRAWN R. BRIGGS 7/18/95
CHECKED
ENGINEER T. THOMAS 10/11/95
PRODUCTION
QA
TURBOCHEF
TITLE SCHEMATIC, D1B-EC/D2B-EC OVEN, 3Ø, 5W, 400-415 VAC
SIZE D CODE IDENT NO DRAWING NO 700-0358
SCALE 1/1 KEY 70003581 SHEET 1 OF 2
DASH NO | NEXT ASSY | USED ON APPLICATION
— 700-1242 D1/D2
— 700-1250 D2
— 700-0350 D1


DWG NO 700-0358 SH 2
I/O CCA
CONTROLLER CCA
W21 FLAT CABLE
W22 FLAT CABLE (OPTIONAL)
RS232 I/O
D9P
D9S
W19-P2
J2
MAG1 OUT
MAG2 OUT
+24 VDCC
M1_DT IN
M2_DT IN
24V RTN3
HX IN
CDM IN
CDP IN
FDP IN
OPTIONAL AUXILIARY ALARM
24V RTN2
FDM IN
CDS IN
FDS IN
W19
24V RTN1
HX OUT
MCTL (+)
MCTL (-)
BM OUT
24V RTN4
BMR IN
+24 VDC
24V RTN
MAG1
MAG2
HTR
CT1
CT2
CT3
EC
HX
CC
GROUNDS THRU MOUNTING SCREWS
J5
KEYBOARD
ROW 1
ROW 2
ROW 3
ROW 4
C1 C2 C3 C4 C5 C6 C7 C8 SHLD
WAVEGUIDE
10 DBM TAP
RG405 COAX
W20
SMA
RF INPUT
SIZE D
CODE IDENT NO
DRAWING NO 700-0358
SCALE NONE
KEY 70003582
SHEET 2


DWG NO 700-0398 SH 1
REVISIONS
LTR DESCRIPTION DATE APPROVED
A ECN 9506001 MJL 6/2/95
1. ADD OPTIONAL AUXILIARY ALARM, ALM2
NOTES: UNLESS OTHERWISE SPECIFIED
1. OVEN SHOWN WITH COOK AND FILTER DOORS OPEN.
2. △ - TEST POINTS FOR CONTINUNITY TEST FOR INTERLOCK/MONITOR TEST.
3. CAPACITOR FURNISHED WITH STIR MOTOR
MASTER SW1 SWITCH
W1P1
W1
E1
W2
W18
F1 12A(MAG1)
F3 12A(MAG2)
F6 5A(AUX)
F5 12A(BLR)
F2 15A(HTR1)
F4 15A(HTR2)
CT1 P/O I/O CCA
CT2 P/O I/O CCA
CT3 P/O I/O CCA
K1
K2
K3
K4
K5
K6
SEE VIEW A
SEE VIEW B
SEE VIEW C
MAG1
MAG2
T1
T2
W5
W8
W4
C1 1.2uF W7
W6
CR1
W16
W11
W14
W10
C2 1.2uF W13
W12
CR2
W17
W9
W15
VIEW A
K5, K6 SOCKETS
CONNECTIONS
VIEW B
K1 BOTTOM
CONNECTIONS
CDP
CDS
CDM
FDP
FDS
FDM
BLR
LED DISPLAY
(ON CONTROLLER CCA)
VIEW C
ALTERNATE POWER SUPPLY
PS24 LAMBDA Z57S-24
+24VDCC
24VDC RTN
LINE
NEUTRAL
P/O W18
W19
FAN2 (MAG)
FAN1 (FLOOR)
TB1
STIR MTR
DT1 (600° F)
DT2 (120° F)
KLXM1 (212°F)
KLXM2 (212°F)
CHAMBER DOOR INLK
FILTER DOOR INLK
HE-1
HE-2
HE-3
6X 450W @240V
RTN1
BMSC
RELIANCE SPEED CNTRLR
208/240 VAC 1 PHASE IN
208/240 VAC 3 PHASE OUT
MOT BLWR MTR
T1 TC1031 #16
T2 TC1032 #16
T3 TC1033 #16
0-10 VDC SPD CMD
SPD CMD COM
RUN CMD BM W18-P1
24V COM
RUNNING
BMR
M2_DT IN
M1_DT IN
MAG1 OUT
MAG2 OUT
CDP IN
FDP IN
FDM IN
CDM IN
FDS IN
CDS IN
HX IN
HX OUT
MCTL (+)
MCTL (-)
BM OUT
24V RTN
+24 VDC
BMR IN
TO W21P1-10 (SEE SH 2)
TO W21P1-9 (SEE SH 2)
TO W21P1-53 (SEE SH 2)
TO W21P1-54 (SEE SH 2)
TO W21P1-24 (SEE SH 2)
TO W21P1-6 (SEE SH 2)
TO W21P1-3 (SEE SH 2)
TO W21P1-28 (SEE SH 2)
TO W21P1-4 (SEE SH 2)
TO W21P1-5 (SEE SH 2)
TO W21P1-7 (SEE SH 2)
TO W21P1-8 (SEE SH 2)
TO W21P1-14 (SEE SH 2)
TO W21P1-49 (SEE SH 2)
TO W21P1-32 (SEE SH 2)
TO W21P1-33 (SEE SH 2)
TO W21P1-52 (SEE SH 2)
TO W18P2-4 (SEE SH 2)
TO W18P2-1 (SEE SH 2)
TO W21P1-13 (SEE SH 2)
700-0391 866
700-0350 866
APPLICATION
UNLESS OTHERWISE SPECIFIED
MATERIAL NOT APPLICABLE
FINISH NOT APPLICABLE
SIGNATURE DATE
DRAWN J. MAXWELL 2/ 8/95
CHECKED
ENGINEER
PRODUCTION
QA
TURBOCHEF
SCHEMATIC, OVEN,
3Ø, 5W, 400-415 VAC, 50 HZ
SIZE D
DRAWING NO 700-0398
SCALE 1/1
KEY 70003981
SHEET 1 OF 2


DWG NO 700-0398 SH 2
I/O CCA
CONTROLLER CCA
W24 FLAT CABLE
W23 FLAT CABLE
CHASSIS GND
SPARE INPUTS
+24 VDC OUT
24V RTN
MCTL
24 GNDA
NC
VCC(TST) OUT
NC
SPARE OUT
SPARE OUTPUTS
CT1
CT2
CT3
KEYBOARD
ROW 1
ROW 2
ROW 3
ROW 4
RS232 TEST I/O
+24 VDC
RF INPUT
WAVEGUIDE
10 DBM TAP
RG405 COAX
SMA
OPTIONAL AUXILIARY ALARM
ALM2
SIZE D
DRAWING NO 700-0398
SCALE NONE
SHEET 2


DWG NO 700-0425 SH 1
REVISIONS
LTR DESCRIPTION DATE APPROVED
F ECN 9407091 D. LANDRE DELETED RF1 FILTER AND NOTE 4, DEL. CDM2 AND FDM2, CHANGED WIRING FOR MAG 1 AND MAG 2. 8/9/94 B.BRIGGS
G ECN 9502016 J.MAXWELL 1. ADD DT2 2. MOVE FAN1 FROM ZN B-6 TO ZN D-3 3. (SH 2) CORRECT CALLOUTS W20-P1 2/13/95 B.BRIGGS
H ECN 9506002 MJL 1.ADD AUXILIARY ALARM, ALM2. 6/2/95
NOTES: UNLESS OTHERWISE SPECIFIED
1. OVEN SHOWN WITH COOK AND FILTER DOORS OPEN.
2. △ - TEST POINTS FOR CONTINUNITY TEST FOR INTERLOCK/MONITOR TEST.
3. CAPACITOR FURNISHED WITH STIR MOTOR
MASTER SWITCH
SW1 40A
W1P1
W1
W2
E1
L1
L2
L3
F1 12A(MAG1)
F9 12A(MAG2)
F7 5A(AUX2)
F6 5A(AUX1)
F3 30A(HTR1)
F4 30A(HTR2)
F2 12A(BLR1)
F5 12A(BLR2)
F8 12A(BLR3)
CT1 P/O I/O CCA
CT2 P/O I/O CCA
CT3 P/O I/O CCA
K1
K2
K3
K4
K5
K6
T1
T2
W5
W8
W4
W9
W11
W14
W10
W15
C1 1.05uF
C2 1.05uF
W7
W6 (-)
W13
W12
CR1
CR2
MAG1
MAG2
9A
HI (TOP)
LO
F
FA
(+)
W16
W17
FAN2 (MAG)
FAN1 (FLOOR)
W18 P3
W18 P4
W18 P2
J1
BLU
BRN
BLK
STIR
.04A
.22uF
.25uF
STIR MTR
BLU
RED
TB1
SEE VIEW A
SEE VIEW B
+24VDCC
MON
CDP
CDS
FDP
FDS
FDM
CDM
FDS
HX
BLR
MAG1
MAG2
HX ON
VIEW A
K5, K6 SOCKETS
CONNECTIONS
VIEW B
K1 BOTTOM
CONNECTIONS
LED DISPLAY
(ON CONTROLLER CCA)
19.5A @240
16.9A @208
6X 450W @240V
HE-1
HE-2
HE-3
DT1
DT2
(600° F)
(120°F)
RTN1
W3
2.2A
W18-P1
LINE 1
LINE 2
+24 VDC
24 VDC RTN
PS 24 IPS PU65-15
W19-P1
VIEW C
ALTERNATE POWER SUPPLY
MOT BLWR MTR
T1 TC1031 #16
T2 TC1032 #16
T3 TC1033 #16
RESTAURANT
208/240 VAC 1 PHASE IN
208/240 VAC 3 PHASE OUT
RELIANCE SPEED CNTRLR
BMSC
0-10V METER CONN
0-10V CMD
0-10V +24 COM
STOP
START
IET RESET
FWD/REV
FN LOSS
+24V COM
DYNAMIC BRK
+24V COM
IET CONTACT
RUNNING
0-10 VDC SPD CMD
SPD CMD COM
RUN CMD BM
24V COM
RUNNING
BMR
SEE VIEW C
CN1
CN2
W19
LOAD1 1A
LOAD2
LINE1
LINE2
P/O W18
PS24 LAMDA ZS75-24
+24VDC
24VDC RTN
W19
M2_OT IN
M1_OT IN
MAG1 OUT
MAG2 OUT
+24 VDCC
CDP IN
FDP IN
RTN1
FDM IN
CDM IN
FDS IN
CDS IN
HX IN
HX OUT
MCTL (+)
MCTL (-)
BM OUT
24V RTN
+24 VDC
BMR IN
TO W21P1-10 (SEE SH 2)
TO W21P1-9 (SEE SH 2)
TO W21P1-53 (SEE SH 2)
TO W21P1-54 (SEE SH 2)
TO W21P1-24 (SEE SH 2)
TO W21P1-6 (SEE SH 2)
TO W21P1-3 (SEE SH 2)
TO W21P1-28 (SEE SH 2)
TO W21P1-4 (SEE SH 2)
TO W21P1-5 (SEE SH 2)
TO W21P1-7 (SEE SH 2)
TO W21P1-8 (SEE SH 2)
TO W21P1-14 (SEE SH 2)
TO W21P1-49 (SEE SH 2)
TO W21P1-32 (SEE SH 2)
TO W21P1-33 (SEE SH 2)
TO W21P1-52 (SEE SH 2)
TO W18P2-4 (SEE SH 2)
TO W18P2-1 (SEE SH 2)
TO W21P1-13 (SEE SH 2)
CHAMBER DOOR INLK
FILTER DOOR INLK
W21 P2
W21 P3
W21 P4
W21 P5
KLXM1
KLXM2
— 700-0390 866
— 700-0350 866
DASH NO
NEXT ASSY
USED ON
APPLICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE FINISH
TOLERANCES: ANGLES ± 1° 2 PLACE DECIMALS ± .03 3 PLACE DECIMALS ± .010
REMOVE BURRS & SHARP EDGES MOLE TOL PER ANSI3397
MATERIAL
NOT APPLICABLE
FINISH
NOT APPLICABLE
SIGNATURE DATE
DRAWN J. MAXWELL 1/27/94
CHECKED
ENGINEER
PRODUCTION
QA JIM DUTY 6/10/94
TURBOCHEF
TITLE
SCHEMATIC, OVEN, 3Ø, 4W, 208/240 VAC
SIZE D
CODE IDENT NO
DRAWING NO 700-0425
SCALE 1/1
KEY 70004251
SHEET 1 OF 2


DWG NO 7000425 SH 2
I/O CCA
CONTROLLER CCA
W24 FLAT CABLE
W23 FLAT CABLE
CHASSIS GND
SPARE INPUTS
+24 VDC OUT
24V RTN
MCTL
24 GNDA
NC
VCC(TST) OUT
NC
SPARE OUT
SPARE OUTPUTS
CT1
CT2
CT3
OPTIONAL AUXILIARY ALARM
RS232 TEST I/O
KEYBOARD
ROW 1
ROW 2
ROW 3
ROW 4
WAVEGUIDE
10 DBM TAP
RG405 COAX
W22
RF INPUT
W19
W20
W21
GRN
W25
SIZE D
DRAWING NO 700-0425
SCALE NONE
SHEET 2

13.0 LIMITED WARRANTY FOR "D" SERIES OVENS

TURBOCHEF® "D" SERIES COOKING SYSTEMS
LIMITED WARRANTY AGREEMENT

Equipment manufactured by TurboChef, Inc. ("TurboChef") is manufactured, inspected, and packaged to meet rigid standards of excellence. TurboChef warrants the Equipment to be free from defects in material and workmanship for up to twelve (12) months from the date of purchase, subject to the conditions and limitations set forth below. THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESSED WARRANTIES OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

1. LIMITATIONS. Equipment must be installed and operated in accordance with TurboChef instructions as detailed in the "Owner's Manual" provided and periodically updated, including reasonable and necessary maintenance by the User. User is responsible for ensuring the suitability of the TurboChef Equipment to their application. There is no warranty against damage resulting from improper care and cleaning, improper installation, abuse, misuse, improper specification, misapplication, or other operating conditions beyond the control of TurboChef. Furthermore, this Limited Warranty does not extend to damage resulting from power failure, fire, flood, lightning surges, and other Acts of God.

2. CONSEQUENTIAL DAMAGES EXCLUDED. This Limited Warranty does not apply to indirect, incidental, or consequential damage to the Equipment or its accessories, nor does it apply to any indirect, special, incidental, or consequential damages (including damages for loss of business, loss of profits or investment, or the like), whether based on breach of contract, breach of warranty, tort (including negligence), product liability or otherwise, even if TurboChef or its representatives have been advised of the possibility of such damages and even if a remedy set forth herein is found to have failed in its essential purpose. Such damage includes any act or omission by a party other than TurboChef, which causes undue or accelerated component wearing, operational complications, and/or general component/system failure. User agrees to indemnify or otherwise hold TurboChef harmless from all claims of third parties that may arise from User's use of the Equipment covered under this Limited Warranty.

3. CONSUMABLE ACCESSORIES EXCLUDED. Components and parts that are normally consumed in the usual course of operation are excluded from this Limited Warranty. Such accessories include, but are not limited to, ceramic platters, air filters, paddles, carts, etc. In addition, Equipment damage resulting from improper care or replacement of such accessories is not covered under this Limited Warranty.

4. MANDATORY CLAIM REPORTS, SERVICE DISPATCH. Claims under this Limited Warranty must be reported to the 24-hour Customer Service Hotline at 1-800-978-2941, or other reporting service TurboChef may designate. The TurboChef Customer Service Department will notify the nearest authorized service facility ("Service Agent") to direct examination, repair, or adjustment. Services will be provided during the Service Agent's established service availability hours.

5. REPAIRS. Defective items covered by this Limited Warranty will be repaired or replaced as necessary without charge. Parts required for repair may be recovered or reprocessed, and replaced parts will become the property of TurboChef at its option. Such repair or replacement is the exclusive remedy available from TurboChef under this Limited Warranty. Repairs or adjustments made by unauthorized agents nullify and void this Limited Warranty. TurboChef, or its Service Agent, will provide the final determination as to whether specific instances are covered under this Limited Warranty.

6. ALTERATIONS AND SAFETY. If User makes any alterations, attaches a device, or uses a supply item that, in Service Agent's judgment, results in damages to the Equipment, the Service Agent will either propose an additional service charge, or request that the Equipment be returned to its standard configuration or that use of the supply item be discontinued. User must accept the proposal or comply with the request within five (5) days. If Service Agent believes that an alteration, attachment or supply item affects the safety of Service Agent personnel or Equipment users, Service Agent will notify User of the problem and may withhold Warranty Service until the problem is remedied.

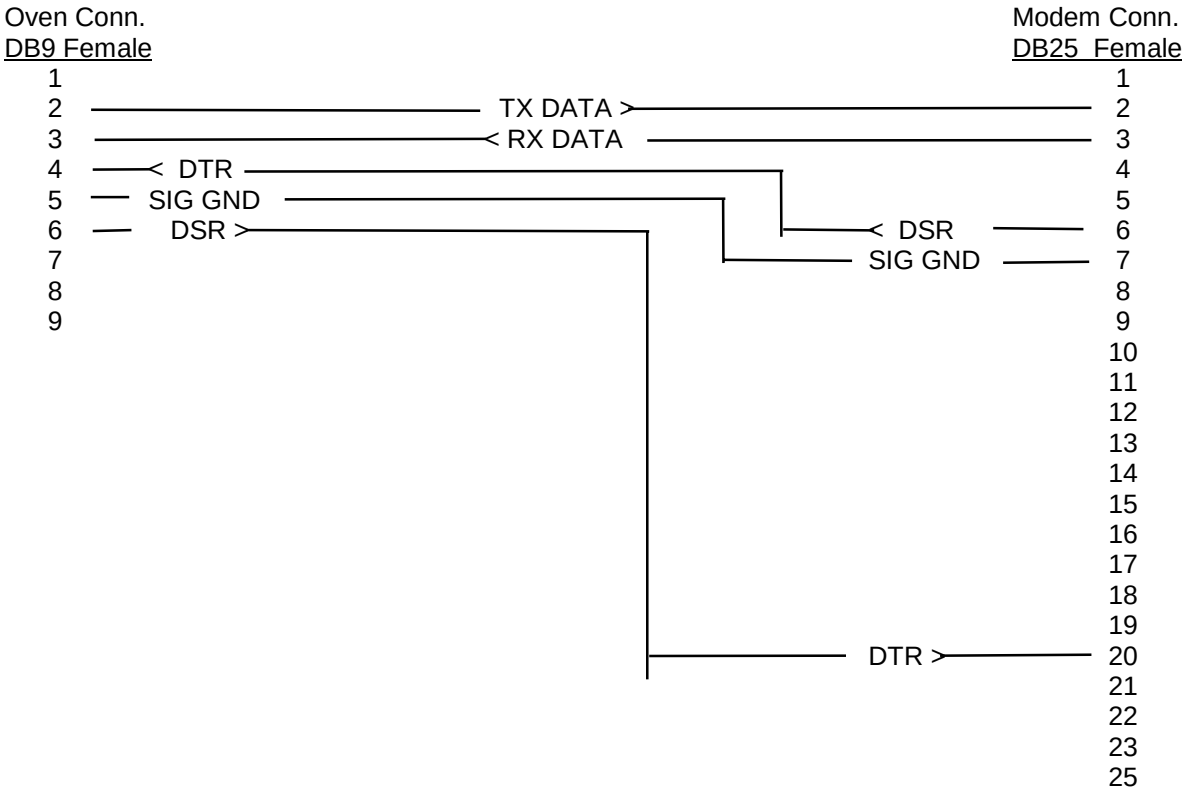
7. SERVICE AGENT CHARGES. In the event that repair services and/or parts are provided by the Service Agent for repairs not covered by this Limited Warranty and Service Agreement, the Service Agent will invoice User for such repair services and User will pay directly to Service Agent the amount invoiced by the Service Agent.

8. EXCLUSIVE REMEDIES. If Service Agent is unable to maintain Equipment in good working order under the conditions described above, TurboChef will, as User's exclusive remedy, replace the Equipment with either an identical product or another product that provides equal or greater capabilities, at the option of TurboChef.

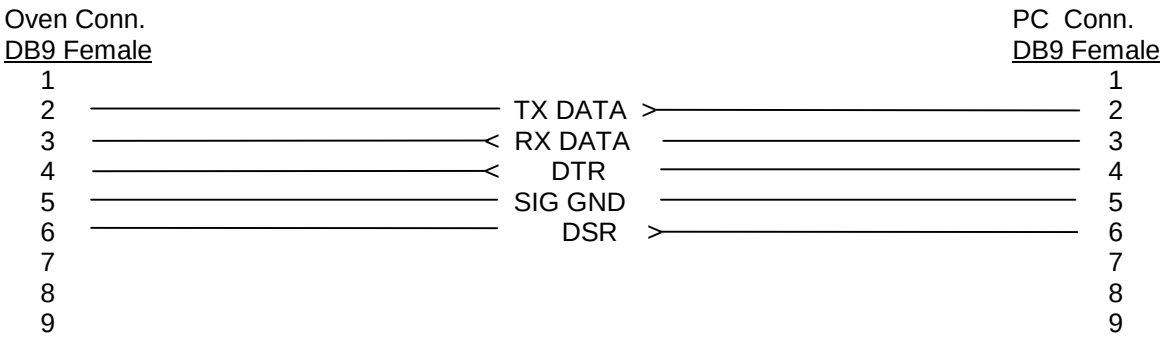
9. EQUIPMENT DAMAGED IN TRANSIT. Claims against carriers for damage in transit must be filed by the User upon careful inspection of the Equipment after arrival.

APPENDIX A

INTERCONNECT BETWEEN OVEN AND MODEM



DIRECT INTERCONNECT BETWEEN OVEN AND PC



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